Section 4.7

Greenhouse Gas Emissions

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4.7.1 Introduction

This section of the Supplemental Recirculated Environmental Impact Report (SREIR) evaluates the greenhouse gas (GHG) emissions impacts of the proposed Grapevine Project (project) that could occur from potentially higher vehicles miles traveled (VMT) than evaluated in the Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR) (collectively, the "2016 EIR") for the project, including the consistency of the project with relevant plans and programs that are applicable to the project area.

The DEIR and FEIR were circulated and publicly reviewed in 2016, and the FEIR was certified by Kern County on December 6, 2016. As discussed in Chapter 2, *Introduction*, the FEIR certification was subsequently rescinded on May 12, 2019, and the County received an application to re-adopt the approvals for the proposed project on May 14, 2019. On April 12, 2019, the County published a Notice of Preparation (NOP) for an SREIR to evaluate potential traffic, air pollution, GHG, noise, public health and growth inducing impacts that could occur from lower internal capture rates (ICRs) and higher VMTs than considered in the 2016 EIR.

An ICR represents the percentage of trips staying within a community compared to total trips generated by the uses in a community. Residential and mixed-use development, such as the proposed project, generate vehicle trips that begin and end within a project study area. These are called "internal" trips. Trips that end or begin outside the project area are called "external" trips. If a project area generates an average daily total of 1,000 trips, for example, and 500 trips begin and end within the community, the average daily ICR would be 50 percent. Traffic trip volumes are highest during "peak" morning (AM) and evening (PM) periods. If a project generates 300 trips during the AM peak period, and 100 of these trips begin and end within the project, the AM peak hour ICR would be 33.3 percent. External trips are generally longer and result in higher vehicle VMT than internal trips and potentially higher mobile GHG emissions. A project's ICRs change as land uses and transportation patterns - which are affected by transit options and technologies - change over time. An ICR analysis generally reflects and considers ICRs and transportation patterns that exist at a specific a point in time of the project buildout process.

The DEIR (2016) analyzed potential peak period project traffic impacts using ICRs generated by the Kern County Council of Governments (Kern COG) 2014 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) Travel Demand Model (Kern COG model). The analysis considered the ICR rates for home to work trips ("Home-Based Work" trips) and home to school, shopping, recreational and other non-work related trips ("Home-Based Other/Non-Home-Based" trips). The Kern COG model projected that, for all trips combined, at buildout the project would have an AM peak period ICR of 72.2 percent and a PM peak period ICR of 71.4 percent.

During the DEIR (2016) comment period, the California Department of Transportation (Caltrans) requested that Fehr & Peers, the project's traffic consultants, conduct a review of Home-Based Work ICRs in certain other California locations. The review found that the average Home-Based Work ICR for the California communities was 57.4 percent. Caltrans requested that the project analysis utilize a Home-Based Work ICR of 28.7 percent (Updated 28.7% HBW ICR), 50 percent lower than the results of the review.

As a result, the DEIR (2016) traffic analysis was revised in the FEIR (2016) to incorporate the 28.7 percent Home-Based Work trip ICR requested by Caltrans. When combined with the Kern COG model ICRs for non-work Home-Based Other/Non-Home-Based trips, the ICRs for all project trips considered in the FEIR (2016) were 59.8 percent in the AM peak period and 64.2 percent in the PM period, lower than the 72.2 percent AM peak period and 71.4 percent PM peak period ICRs analyzed in the DEIR (2016). The FEIR (2016) considered the significance of all GHG-related significant impacts that were determined to potentially occur using the Updated 28.7% HBW ICR, resulting in lower AM and PM peak period ICRs than considered in the DEIR (2016).

This section of the SREIR considers the potential significant GHG emissions impacts that could occur with project buildout and other potential development scenarios, such as residential-only development, that could result in higher weekday VMT than considered in the DEIR (2016) and FEIR (2016). To identify a range of potential scenarios that could result in lower ICRs and higher VMT compared to the project, a total of 22 Screening Scenarios were developed by the project traffic consultant to evaluate how daily, AM, and PM peak hour trip generation rates and VMT could vary with ICRs that were 10 and 20 percent lower than used in the 2016 EIR or from other identified development patterns, such as primarily residential or commercial/light industrial development, that could also affect project area VMT. As described in the *Supplemental Recirculated Transportation Impact Study Technical Report for the Grapevine Specific Plan And Community Plan Project*, dated May 31, 2019, and prepared by Fehr and Peers and included as Appendix E.2 in Volume 4 of this SREIR (2019 Traffic Study), none of the scenarios were found to generate a greater amount of daily average and peak hour trips than identified in the 2016 EIR, and five of the scenarios were found to generate higher levels of VMT than in the 2016 EIR either from lower ICRs than the Updated 28.7% HBW ICR considered in the FEIR (2016) or based on different potential project development buildout scenarios. Vehicular emissions are partially dependent on project VMT, so these five higher VMT scenarios are evaluated in this section. The five higher VMT Reduced ICR Scenarios assessed quantitatively in this section, consistent with their introduction in Chapter 3, *Project Description*, include the following:

- **Scenario A.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 100 percent of full buildout with a 10 percent reduction in the daily and peak hour ICRs used in the 2016 EIR (Screening Scenario 1 and Scenario 1 in the 2019 Traffic Study, Volume 4, Appendix E.2).
- **Scenario B.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 100 percent of full buildout with a 20 percent reduction in the daily and peak hour ICRs used in the 2016 EIR (Screening Scenario 2 and Scenario 2 in the 2019 Traffic Study, Volume 4, Appendix E.2).
- **Scenario C.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 75 percent of full buildout (9,000 dwelling units and 3,185,000 square feet of commercial/light industrial uses) with a 20 percent reduction in the daily and peak hour ICRs used in the 2016 EIR (Screening Scenario 4 and Scenario 4 in the 2019 Traffic Study, Volume 4, Appendix E.2).
- **Scenario D.** Development of 14,000 dwelling units and schools and parks as required by applicable land use laws and regulations, with no complementary commercial/light industrial

amenities or on-site employment-generating land uses (Screening Scenario 9 and Scenario 9 in the 2019 Traffic Study, Volume 4, Appendix E.2).

- **Scenario E.** Development of 12,000 dwelling units and schools and parks as required by applicable land use laws and regulations, with no complementary commercial/light industrial amenities or on-site employment-generating land uses (Screening Scenario 10 and Scenario 10 in the 2019 Traffic Study, Volume 4, Appendix E.2).

This section of the SREIR also includes the following:

- Environmental and regulatory settings for the analysis of potential impacts related to GHG emissions from the Reduced ICR scenarios.
- Comparison of the GHG emissions for Reduced ICR Scenarios to the 2016 EIR, as well as the Updated 28.7% HBW ICR, which includes full buildout of the project's proposed 12,000 residential units and 5.1 million square feet of commercial/light industrial uses analyzed with updated trip rates.
- The GHG emissions information in this section is based primarily on the *Air Quality and Greenhouse Gas Emissions Technical Report for the Grapevine Specific and Community Plan Project Supplemental Recirculated Environmental Impact Report*, dated July 2019, and prepared by Dudek, the project's air quality and GHG consultant, and included as Appendix D in Volume 2 of this SREIR (2019 Air Study; Dudek 2019a).
- Section 4.7 of the DEIR (2016), the FEIR (2016), and associated traffic and transportation and air quality/GHG appendices of the 2016 EIR are included in Volumes 5 to 12; the 2019 Traffic Study (Fehr & Peers 2019) and 2019 Air Study, are included in Volume 4 and Volume 2, respectively, and incorporated herein.

4.7.2 Environmental Setting

GHGs and climate change are a cumulative global issue. Global climate change is an international phenomenon, and the regulatory background and scientific data are changing rapidly. The California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) regulate GHG emissions within the State of California and the United States, respectively. While the CARB has the primary regulatory responsibility within California for GHG emissions, local agencies can also adopt policies for GHG emission reduction.

Climate Change

In the early 1960s, scientists recognized that carbon dioxide (CO_2) levels in the atmosphere were rising every year. It was also noted that several other gases, including methane (CH_4) and nitrous oxides (N_2O) were also increasing. Levels of these gases have increased by approximately 40 percent since large-scale industrialization began around 150 years ago, according to the EPA. After numerous computer-simulated model runs on the effects of these increases in the atmosphere, it was concluded that the rising concentrations almost always resulted in an increase of average global temperature. Rising temperatures may, in turn, produce changes in weather, sea levels and land use patterns, commonly referred to as "climate change" (U.S. Energy Information Administration [EIA], 2016). There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions

of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures.

According to the California Climate Change Center (CCCC), climate change impacts would affect all of the sectors considered in this report: sea level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply. Additionally, climate change could produce compounding impacts. For instance, in the San Francisco Bay Delta, heightened sea levels and high river inflows from warmer storms would place levee systems in greater jeopardy of flooding. The CCCC indicates that some of the most dramatic climate change impacts would be experienced as increased frequency and severity of extreme events, such as heat waves, wildfires, flooding, and conditions conducive to air pollution formation (with a related increase in the incidence of infections, disease, asthma, and other health-related problems).

Greenhouse Gases (GHGs)

Many chemical compounds found in the Earth's atmosphere act as GHGs, which allow sunlight to enter the atmosphere freely. When sunlight strikes the Earth's surface, some of it is reflected back towards space as infrared radiation (heat). GHGs absorb this infrared radiation and trap the heat in the atmosphere. Over time, the amount of energy sent from the sun to the Earth's surface should be about the same as the amount of energy radiated back into space, leaving the temperature of the Earth's surface roughly constant. Many gases exhibit these "greenhouse" properties. Principal GHGs include CO_2, CH_4, N_2O, ozone (O_3), and water vapor (H_2O). Some GHGs, such as CO_2, CH_4, and N_2O, can occur naturally and are emitted into to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Man-made GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3), which are associated with certain industrial products and processes (Dudek, 2016b). These gases prevent heat from escaping to space.

The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are listed below.

- **Carbon Dioxide (CO_2)**: CO_2 is the most abundant GHG in the Earth's atmosphere after water vapor. CO_2 enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and chemical reactions (e.g., the manufacture of cement). CO_2 is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle. CO_2 absorbs terrestrial infrared radiation that would otherwise escape to space and has an atmospheric lifetime of up to 200 years; therefore, it is a more important GHG than water vapor, which has an atmospheric residence time of only a few days. Global warming potential (GWP) is a concept developed to allow the comparison of the ability of each GHG to trap heat in the atmosphere relative to CO_2 or a specific time horizon. CO_2 provides the reference point for the GWP of other gases, with the GWP of CO_2 being equal to 1.

- **Methane (CH_4)**: CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH4 emissions also result from livestock and agricultural practices and the decay of organic waste in municipal solid waste landfills. The chemical lifetime of CH_4 in the atmosphere is 12 years. CH_4 is about 25 times more powerful at warming the atmosphere than CO_2 (a GWP of 25), based on the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment

Report (the relevant version as it is utilized by the California Emissions Estimator Model (CalEEMod) emissions model discussed later) (IPCC 2007).

- **Nitrous Oxide (N_2O)**: N_2O is emitted during agricultural and industrial activities as well as during combustion of fossil fuels and solid waste. N_2O has a long atmospheric lifetime (120 years) and heat-trapping effects about 298 times more powerful than CO_2 on a per-molecule basis (a GWP of 298), based on the IPCC Fourth Assessment Report (IPCC, 2007).
- **Fluorinated Gases**: HFCs, PFCs, and SF_6 are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are often used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochloro-fluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent GHGs with GWPs of between 124 and 22,800 based on the IPCC Fourth Assessment Report, they are sometimes referred to as high GWP gases (IPCC 2007).

Another GHG is black carbon, a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify the global warming potential. Diesel particulate matter emissions are a major source of black carbon and are also TACs that have been regulated and controlled in California for several decades in order to protect public health. In relation to declining diesel particulate matter from CARB's regulations pertaining to diesel engines, diesel fuels, and burning activities, the CARB estimates that annual black carbon emissions in California have reduced by 70 percent between 1990 and 2010, with 95 percent control expected by 2020 (Dudek, 2016b).

The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

As noted above, GWP is a relative measure, compared to CO_2, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO_2e) emissions for ease of comparison.

GHGs, in most cases, have both natural and anthropogenic sources. Natural mechanisms already exist as part of the "carbon cycle" for removing GHGs from the atmosphere (often called land or ocean sinks). Levels of GHGs, due to the increase in anthropogenic sources, have exceeded the normal rates of natural absorption. This has resulted in increased atmospheric concentrations of GHGs and potentially human-induced global warming.

GHG emissions in the United States come mostly from energy use. These are driven largely by economic growth, fuel used for electricity generation, and weather patterns affecting heating and cooling needs. Energy-related CO_2 emissions, resulting from fossil fuel exploration and use account for three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels. More than half the energy-related emissions come from large stationary sources such as power plants; a third comes from transportation; while

industrial processes, agriculture, forestry, other land uses, and waste management make up a majority of the remainder of sources (USEPA, 2014).

Climate models predict that the average temperature at the Earth's surface could increase from 2.5 to 10.4 degrees Fahrenheit above 1990 levels by the end of this century if GHGs continue to increase. As the average temperature of the Earth increases, weather may be affected, including changes in precipitation patterns, accumulation of snow pack, and intensity and duration of spring snowmelt. There may be rises in sea level, resulting in coastal erosion and inundation of coastal areas. Emissions of air pollutants and ambient levels of pollutants also may be affected in areas. Climate zones may change, affecting the ecology and biological resources of a region. There may be changes in fire hazards due to the changes in precipitation and climate zones.

Some changes to global climate are already occurring. These include rise of sea level, shrinking glaciers, changes in the range and distribution of plants and animals, lengthening of growing seasons, trees blooming earlier, ice on rivers and lakes freezing later and breaking up earlier, and thawing of permafrost.

Scientists believe that most areas in the United States will continue to warm, although some will likely warm more than others. Predicting which parts of the country will become wetter or drier is extremely difficult, but scientists generally expect increased precipitation and evaporation, and drier soil in the middle parts of the country.

4.7.3 Regulatory Setting

In 1988, the United Nations established the IPCC to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United Nations Framework Convention on Climate Change established an agreement with the goal of controlling GHG emissions, including CH_4. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The plan consists of more than 50 voluntary programs. Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere (chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform) were phased out by 2000 (methyl chloroform was phased out by 2005).

Global warming and climate change have received substantial public attention for more than 30 years. For example, the United States Global Change Research Program was established by the Global Change Research Act of 1990 to enhance the understanding of natural and human-induced changes in the Earth’s global environmental system, to monitor, understand and predict global change, and to provide a sound scientific basis for national and international decision making. Even so, analytical tools have not been developed to determine the effect on worldwide global warming from a particular increase in GHG emissions, or the resulting effects on climate change in a particular locale. The scientific tools needed to evaluate the impacts that a specific project may have on the environment are even farther in the future.

This section provides further regulatory background on GHGs and identifies specific federal, state and regional policies, separately noting changes in law since the 2016 EIR.

Federal

U.S. Environmental Protection Agency

On April 2, 2007, in *Massachusetts v. USEPA*, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the EPA must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA is required to follow the language of Section 202(a) of the Clean Air Act. The Supreme Court decision resulted from a petition for rulemaking under Section 202(a) filed by more than a dozen environmental, renewable energy, and other organizations.

On April 17, 2009, the Administrator signed Proposed Endangerment and Cause or Contribute findings for GHGs under Section 202(a) of the Clean Air Act. The EPA held a 60-day public comment period, which ended June 23, 2009, and received over 380,000 public comments. These included both written comments as well as testimony at two public hearings in Arlington, Virginia and Seattle, Washington. The EPA carefully reviewed, considered, and incorporated public comments and issued the final Findings.

The EPA found that six GHGs taken in combination endanger both the public health and the public welfare of current and future generations. The EPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that endangers public health and welfare under Section 202(a) of the Clean Air Act. These findings were based on careful consideration of the full weight of scientific evidence and a thorough review of numerous public comments received on the Proposed Findings published April 24, 2009. These Findings became effective on January 14, 2010.

Specific GHG Regulations that the EPA has adopted to date are as follows:

40 Code of Federal Regulations Part 98. Mandatory Reporting of Greenhouse Gases Rule

On September 22, 2009, EPA issued a final rule to require reporting of GHG emissions from all sectors of the United States economy (74 Federal Register [FR] 56260–56519). Fossil fuel and industrial GHG suppliers, motor vehicle and engine manufacturers, and facilities that emit 25,000 metric tons (MT) CO_2e or more per year are required to report GHG emissions data to EPA annually. The first annual reports for the largest emitting facilities, covering calendar year 2010, were submitted to EPA in 2011. Additionally, reporting of emissions is required for owners of SF_6- and PFC-insulated equipment when the total nameplate capacity of these insulating gases is above 17,280 pounds. This new program covers approximately 85 percent of the nation's GHG emissions and applies to roughly 10,000 facilities. The EPA's new reporting system was intended to provide a better understanding of GHG sources and guide development of the policies and programs to reduce emissions. The data also allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective methods to reduce emissions in the future (Dudek, 2016b). The reporting rule has been amended numerous times, most recently on October 22, 2015. The project, including stationary sources, would not be expected to trigger federal GHG reporting according to the rule.

USEPA and National Highway Traffic Safety Administration Joint Final Rules for Vehicle Standards

On April 1, 2010, the EPA and National Highway Traffic Safety Administration (NHTSA) announced a joint final rule to establish a national program consisting of new standards for light-duty vehicles model years 2012 through 2016. The joint rule is intended to reduce GHG emissions and improve fuel economy. The EPA approved the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA approved Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act (75 FR 25324–25728). The final rule became effective on July 6, 2010 (75 FR 25324–25728).

Clean Power Plan and New Source Performance Standards for Electric Generating Units

On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribed how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. Implementation of the Clean Power Plan was subsequently stayed by the U.S. Supreme Court pending resolution of several lawsuits challenging the plan.

Following the County's certification of the 2016 EIR, on March 28, 2017, President Donald Trump signed Executive Order (EO) 13783 calling for EPA review of the Clean Power Plan.

New Federal Laws Adopted Since the 2016 Certification of the Grapevine Environmental Impact Report (EIR)

After the Grapevine EIR was certified, the Federal government adopted, amended or repealed laws and regulations affecting project-related GHG emissions, as discussed below.

Affordable Clean Energy Rule

On June 19, 2019, EPA published a final rule repealing the Clean Power Plan, adopting the Affordable Clean Energy (ACE) rule requiring states to prepare and submit to EPA plans that establish CO_2 performance standards for certain existing coal-fired electric utility generating units within their jurisdiction, and finalizing regulations governing implementation of the ACE rule and any future emissions guidelines that the EPA may issue under Section 111(d) of the Clean Air Act. Also on June 19, 2019, California Governor Gavin Newsom's office published a press release stating that California "and a coalition of states" will initiate a legal challenge of the ACE.

Federal Vehicle Standards

In August 2016, EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018–2027 for certain trailers, and model years 2021–2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA, 2016).

In August 2018, EPA and NHTSA proposed to amend certain fuel economy and GHG standards for passenger cars and light trucks and establish new standards for model years 2021 through 2026. Compared to maintaining the post-2020 standards now in place, the 2018 proposal would increase

U.S. fuel consumption by about half a million barrels per day (2 to 3 percent of total daily consumption, according to the Energy Information Administration) and would impact the global climate by 3/1000th of 1 degree Celsius by 2100 (EPA NHTSA, 2018). California and 16 other states have filed a lawsuit to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives. Thus, the timing and consequences of the 2018 federal proposal are speculative at this time. Further, the current chair of CARB (Mary Nichols) has announced that CARB will continue to file lawsuits to reverse any Trump administration decision to lessen vehicle efficiency standards, decline to allow California to enforce more stringent vehicular air pollution standards under the waiver procedure established by the federal Clean Air Act, or otherwise reduce the stringency of federal air pollution regulations, and has further announced CARB's intention to continue to independently enforce federal standards in California while such lawsuits are pending. It is not reasonably foreseeable that less stringent federal air pollution standards will be applicable to the project given independent California authority, the length of time required to complete the federal litigation process, the absence of any injunction precluding California from enforcing more stringent federal standards while such lawsuits are present, and CARB's announced intention to continue to enforce federal air regulations rescinded or modified by the Trump administration.

State

California Environmental Quality Act

A variety of statewide rules and regulations have been implemented or are in development in California that mandate the quantification or reduction of GHGs. Under the California Environmental Quality Act (CEQA), an analysis and mitigation of emissions of GHGs and climate change in relation to a project is required where it has been determined that a project will result in a significant addition of GHGs. Certain Air Pollution Control Districts (APCDs) have proposed their own levels of significance. The San Joaquin Valley Air Pollution Control District (SJVAPCD), which has regulatory authority over the air pollutant emissions from this project, has adopted a significance threshold for projects where the SJVAPCD acts as CEQA Lead Agency (SJVAPCD, 2009); however, Kern County has not adopted a significance threshold for these emissions.

California Supreme Court Ruling In Center for *Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 2014 (*Newhall*)

In *Center for Biological Diversity v. Department of Fish and Wildlife* (*Newhall*), the Supreme Court evaluated the California Department of Fish and Wildlife's (CDFW) analysis of potential impacts caused by GHG emissions contained in the EIR for the proposed land development called Newhall Ranch. In the EIR, the CDFW analyzed GHG emissions under Assembly Bill (AB) 32, using the business-as-usual (BAU) comparison as its sole criterion of significance.

In *Newhall*, the Supreme Court concluded that a finding of consistency with meeting statewide emission reduction goals is a legally permissible criterion of significance when analyzing potential impacts of GHG emissions under CEQA. However, the Court found that the EIR's conclusion that the project's emissions would be less than significant under that criterion was not supported by substantial evidence, and remanded back to the appellate court the narrow issue of whether

substantial evidence supported the application of AB 32 statewide GHG reduction goal of 29 percent to new land use projects.

The Court then identified "potential options" for lead agencies evaluating cumulative significance of a proposed land use development's GHG emissions in future CEQA documents, but the Court was careful to note that there was no "guarantee" that any of these would be sufficient, stating:

"We do not, of course, guarantee that any of these approaches will be found to satisfy CEQA's demands as to any particular project; what follows is merely a description of potential pathways to compliance, depending on the circumstances of a given project."

The "potential pathways to compliance" suggested by the Court are as follows:

1. **Business As Usual (BAU) Model:** While the Court cautioned that the Scoping Plan may not be appropriate at the project-level, the BAU model might be used to determine what level of reduction from business as usual a new land use development at the proposed location must contribute in order to comply with statewide goals pursuant to AB 32. The Court specifically directed that reliance on this type of quantitative threshold must be supported by substantial evidence in the record that links the statewide GHG reduction standard to the appropriate GHG reduction standard for the specific type of project under consideration.
2. **Compliance With Regulatory Programs Designed To Reduce Greenhouse Gas Emissions:** The Court suggests that a lead agency could rely on a showing of compliance with regulatory programs designed to reduce GHG emissions in order to demonstrate consistency with AB 32's goals. The Court clarifies that a significance analysis based on compliance with such statewide regulations only goes to impacts within the area governed by the regulations.
3. **Local Climate Action Plan Or Other "Geographically Specific Greenhouse Gas Emission Reduction Plans":** The Court points out that these plans may provide a basis for the tiering or streamlining of project-level CEQA analysis, so long as the plan is "sufficiently detailed and adequately supported."
4. **Regional Sustainable Community Strategy (SCS):** The Court also articulates that a lead agency need not additionally analyze GHG gas emissions from cars and light trucks in CEQA documents for certain residential, mixed use and transit priority projects that are consistent with an applicable SCS adopted pursuant to Senate Bill (SB) 375.
5. **Numerical GHG Significance Thresholds:** Although noting that use of such thresholds is not required, the Court favorably cited to the Bay Area Air Quality Management District GHG significance thresholds, based on compliance with AB 32, which use a "service population" GHG ratio threshold for land use projects and a 10,000 ton annual GHG emission threshold for industrial projects. The Court remanded for further consideration the application of the 29 percent overall Scoping Plan metric, which is used by several Air Districts and, like the favorably cited Bay Area Air Quality Management District metric, is based on AB 32.
6. **Executive Order Nos. S-3-05 and B-30-15:** Citing to EO Nos. S-3-05 and B-30-15, the Court cautioned that those EIRs taking a goal-consistency approach to CEQA significance may "in the near future" need to consider the project's effects on meeting emissions reduction targets beyond 2020.

Following the Supreme Court's decision in *Newhall*, the EIR at issue in that case was set aside on remand by the lower court. On November 2016, the CDFW released a draft Additional

Environmental Analysis (AEA) intended to address the agency's CEQA compliance obligations (CDFW, 2016). The AEA does not respond to the Supreme Court's direction to provide substantial evidence supporting the 29 percent BAU statutory GHG reduction threshold relied upon by the *Newhall* EIR. The AEA also does not include an assessment of the *Newhall* project's consistency with any of the Court's suggested GHG CEQA compliance pathways, although referenced documentation in the *Newhall* administrative record do include and confirm compliance with each pathway. Instead, as described in the AEA, the *Newhall* project applicant (Five Point LLC) voluntarily modified its project and proposed to achieve "net zero" GHG emissions for the project with the implementation of the project applicant's "zero net emission" proposal, which was made enforceable by the addition of 13 mitigation measures that correspond to the applicant's proposal, as further described in the AEA. The AEA states that the adoption and implementation of the 13 mitigation measures would reduce mobile source, electricity, natural gas, vegetation removal, and construction-related emissions by the amount of emissions estimated for the project and result in no net contributions of GHG emissions from the project, or "zero net emissions." The AEA further concludes that because the project would result in no net increase of GHG emissions after implementation of the mitigation measures, there would be no contribution of GHG emissions to cumulative GHG emissions influencing global climate change and the *Newhall* project would not conflict with any plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs. Consequently, the AEA concludes that project GHG and climate change impacts would be less than significant (CDFW, 2016, pp. 1-18).

California Code of Regulations Title 24

Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (Public Resources Code [PRC] Section 25402[b][1]). The regulations have the overall goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (PRC Section 25402). These regulations are analyzed for technological and economic feasibility (PRC Section 25402[d]) and cost effectiveness (PRC Sections 25402[b][2] and [b][3]). These building code standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and reduce air pollutant emissions either by reducing the quantity of energy required by the building (e.g., with water conservation measures that reduce water use and thus the quantity of water requiring emission-causing transportation and treatment, or with energy efficiency standards such as enhanced insulation that reduce the need for heating and air conditioning (HVAC) and likewise result in less energy consumption and air pollutant emissions from these HVAC uses).

Assembly Bill (AB) 1493

On July 22, 2002, former Governor Gray Davis signed AB 1493, also known as the Pavley Regulations or the Clean Car Standards. AB 1493 required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of GHG emissions emitted by passenger vehicles and light-duty trucks. Subsequent regulations were adopted by CARB in September 2004.

The regulations were threatened by automaker lawsuits and were stalled by the EPA's initial denial to allow California to implement GHG standards for passenger vehicles. The EPA later granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009. On September 24, 2009, the CARB adopted amendments to the Pavley regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016.

Executive Order S-1-07

Issued on January 18, 2007, EO S-1-07 sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste. In addition, the Low Carbon Fuel Standard would drive the availability of plug-in hybrid, battery electric, and fuel-cell power motor vehicles. The Low Carbon Fuel Standard is anticipated to lead to the replacement of 20 percent of the fuel used in motor vehicles with alternative fuels by 2020.

AB 32

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. The legislature stated, "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 caps California's GHG emissions at 1990 levels by 2020 and requires CARB, the State agency charged with regulating statewide air quality, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. This law establishes periodic targets for reductions, and requires certain facilities to report emissions of GHGs annually; AB 32 also reserves the ability to reduce emissions targets for certain sectors that contribute the most to emissions of GHGs, including the transportation sector.

This agreement represents the first enforceable statewide program in the U.S. to cap all GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generation facilities located outside the state that serve California residents and businesses.

The list of impacts included in AB 32 may be considered substantial evidence of environmental impacts requiring analysis in CEQA documents. AB 32 charges the CARB with responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. CARB has adopted a list of discrete early action measures that can be implemented to reduce GHG emissions. CARB has defined the 1990 baseline emissions for California, and has adopted that baseline as the 2020 statewide emissions cap. CARB is conducting rulemaking for reducing GHG emissions to achieve the emissions cap by 2020. In designing emission reduction measures, CARB must aim to minimize costs, maximize benefits, improve and modernize California's energy infrastructure, maintain electric system reliability, maximize additional environmental and economic co-benefits for California, and complement the state's efforts to improve air quality.

The AB 32 Scoping Plan contains the main strategies California will use to reduce the GHG emissions that cause climate change. The scoping plan has a range of GHG emission reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program. The proposed scoping plan was released on October 15, 2008 and approved at the Board hearing on December 12, 2008.

On October 20, 2011, CARB approved a cap-and-trade program as part of AB 32, with compliance obligations that became effective in 2013. An initial cap will be implemented for the electrical sector and any large industrial source that emits more than 25,000 MT CO_2e emissions per year. Over time, the cap will be reduced so that the program will apply to a broader range of facilities.

In May 2014, CARB adopted a Scoping Plan update that revised the 2020 emissions target to 431 million MT CO_2e (based on updated GWPs for GHGs) and also builds upon the initial Scoping Plan with new strategies and recommendations. The 2014 Scoping Plan Update identified opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The 2014 Scoping Plan Update also defined CARB's climate change priorities for the following 5 years and set the groundwork to reach California's long-term climate goals set forth in EO S-3-05 and B-16-2012. EO B-16-2012 directed state entities under the governor's direction and control to support and facilitate development and distribution of zero-emission vehicles (ZEVs). Former Governor Jerry Brown's executive order set a long-term target of reaching 1.5 million ZEVs on California's roadways by 2025. On a statewide basis, the executive order also established a target reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050. (Dudek, 2016b)

Senate Bill (SB) 97

SB 97, enacted in August 2007, required the Office of Planning and Research (OPR) to develop guidelines for the mitigation of GHG emissions or effects related to releases of GHG emissions. On April 13, 2009, OPR submitted proposed amendments to the California Natural Resources Agency (CNRA), in accordance with SB 97, regarding analysis and mitigation of GHG emissions. Formal rulemaking was conducted in 2009 prior to adopting the amendments. As discussed below, the CEQA significance analysis for the project was conducted in accordance with the OPR guidance developed under this statute.

As part of the guidelines, OPR recommends that CARB set statewide thresholds of significance and emphasized the need to have a consistent threshold available to analyze projects. The draft guidelines also noted that the analyses should be based on the best available information. As directed by SB 97, the CNRA adopted amendments to the State CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the amendments and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010.

Senate Bill (SB) 375

In August 2008, the legislature passed, and on September 30, 2008, former Governor Schwarzenegger signed, SB 375 (Steinberg), which addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. Regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, as determined by CARB, are required to consider the emission reductions associated with vehicle emission standards

(see AB 1493), the composition of fuels (see EO S-1-07), and other CARB-approved measures to reduce GHG emissions. Regional metropolitan planning organizations will be responsible for preparing an SCS within their RTP.

Senate Bill (SB) 1078

Approved by former Governor Gray Davis in September 2002, SB 1078 (Sher) established the Renewable Portfolio Standard (RPS) program, which requires an annual increase in renewable generation by the utilities equivalent to at least one (1) percent of sales, with an aggregate goal of 20 percent by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20 percent of their power from renewable sources by 2010 (see SB 107).

Senate Bill (SB) 107

Approved by former Governor Arnold Schwarzenegger on September 26, 2006, SB 107 (Simitian) requires investor-owned utilities such as Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric, to generate 20 percent of their electricity from renewable sources by 2010.

Senate Bill (SB) X1 2

On April 12, 2011, former Governor Jerry Brown signed SB X1 2 in the First Extraordinary Session, which expands the RPS by establishing a goal of 20 percent of the total electricity sold to retail customers in California per year by December 31, 2013, and 33 percent by December 31, 2020. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current. A renewable electrical generation facility under this bill would also meet other specified requirements with respect to its location. In addition to the retail sellers covered by SB 107, SB X1 2 adds local publicly owned electric utilities to the RPS. By January 1, 2012, the California Public Utilities Commission (CPUC) is required to establish the quantity of electricity products from eligible renewable energy resources to be procured by retail sellers in order to achieve targets of 20 percent by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. The statute also requires that the governing boards for local publicly owned electric utilities establish the same targets and that the governing boards be responsible for ensuring compliance with these targets. The CPUC will be responsible for enforcement of the RPS for retail sellers, while the CEC and CARB will enforce the requirements for local publicly owned electric utilities.

Advanced Clean Cars Program

In January 2012, CARB approved the Advanced Clean Cars program, a new emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB, 2011). To improve air quality, CARB will propose new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025 cars will emit 75 percent less smog-forming pollution than the average new car sold today. To reduce GHG emissions, CARB, in conjunction with the EPA and the

NHTSA, has adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34 percent in 2025. The ZEV program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018 to 2025 model years. The Clean Fuels Outlet regulation will ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

Senate Bill (SB) 605

On September 21, 2014, former Governor Jerry Brown signed SB 605, which requires CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state.

Senate Bill (SB) 350

Former Governor Jerry Brown signed SB 350 on October 7, 2015, which expands the RPS by establishing a goal of 50 percent of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 includes the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses upon which an energy efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal. SB 350 also provides for the transformation of the California Independent System Operator into a regional organization to promote the development of regional electricity transmission markets in the western states and to improve the access of consumers served by the California Independent System Operator to those markets, pursuant to a specified process.

California Air Pollution Control Officers Association

The California Air Pollution Control Officers Association (CAPCOA) is the association of air pollution control officers representing all 35 air quality agencies throughout California. CAPCOA is not a regulatory body, but it has been an active organization in providing guidance in addressing the CEQA significance of GHG emissions and climate change as well as other air quality issues. The GHG analysis set forth in this report has been informed, in part, by the expertise and methodologies described in the following documents published by CAPCOA: (1) *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* (CAPCOA, 2008); and (2) *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (CAPCOA, 2010). The methodologies used in this GHG analysis are consistent with the CAPCOA guidelines.

CARB Cap-and-Trade for Stationary Sources and Fuels

SJVAPCD approved Policy APR-2025 (*CEQA Determinations of Significance for Projects Subject to CARB's GHG Cap-and-Trade Regulation*) to evaluate whether projects subject to the cap-and-trade regulation would comply with plans for reducing GHG emissions supported by an environmental review compliant with CEQA requirements, and that compliance with this plan would adequately mitigate GHG emissions for CEQA purposes under the SJVAPCD thresholds.

SJVAPCD concluded that the cap-and-trade regulation is such a plan, and that compliance would result in a project having a less than significant impact for GHG emissions that are subject to the cap-and-trade regulations. The cap-and-trade regulation applies to providers of electricity generated or imported into California, large industrial facilities emitting more than 25,000 MT CO_2e per year, and other specific facilities, as well as to distributors of transportation fuels, natural gas, and other fuels. The regulation requires that emissions generated by these facilities and combustion of fuels be reduced over time. Accordingly, the SJVAPCD found that "GHG emission increases caused by fuel use (other than jet fuels [which are not regulated under the cap-and-trade regulation]) are determined to have a less than significance impact on global climate change under CEQA." SJVAPCD Policy APR-2015 is consistent with the recent case *Association of Irritated Residents v. Kern County Board of Supervisors, et al.* (2017) 17 Cal.App.5th 708, wherein the Court of Appeal held that CEQA does in fact authorize a lead agency "to determine a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the cap-and-trade program."

Executive Orders

The current and prior Governors also issued several Executive Orders regarding climate change and GHG reductions. These orders include, but are not limited to, the following:

Executive Order S-3-05

EO S-3-05 was established by former Governor Arnold Schwarzenegger in June 2005. EO S-3-05 establishes statewide emission reduction targets through the year 2050:

- 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.

This Executive Order does not include any specific requirements that pertain to the project. However, actions taken by the State to implement these goals may affect the project, depending on the specific implementation measures that are developed.

Executive Order S-13-08

Former Governor Arnold Schwarzenegger issued EO S-13-08 on November 14, 2008. The executive order is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. It directs state agencies to take specified actions to assess and plan for such impacts. It directs the CNRA, in cooperation with the California Department of Water Resources, CEC, California's coastal management agencies, and the Ocean Protection Council, to request that the National Academy of Sciences prepare a Sea Level Rise Assessment Report to assess the state's vulnerability. The report summarizes key climate change impacts to the state for the following areas: public health, ocean and coastal resources, water supply and flood protection, agriculture, forestry, biodiversity and habitat, and transportation and energy infrastructure. The report then recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Executive Order B-16-12

Former Governor Jerry Brown issued EO S-16-12 on March 23, 2012. The Executive Order requires that state entities under the governor's direction and control support and facilitate the rapid commercialization of ZEVs.

Executive Order B-18-12

Former Governor Jerry Brown issued EO S-18-12 on April 25, 2012. The Executive Order directs state agencies, departments, and other entities under the governor's executive authority take actions to reduce entity-wide GHG emissions by at least 10 percent by 2015 and 20 percent by 2020, as measured against a 2010 baseline.

Executive Order B-30-15

On April 29, 2015, former Governor Jerry Brown issued an executive order that identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32.

New State Laws Adopted Since the 2016 Certification of the Grapevine EIR

Following the 2016 certification of the Grapevine EIR, California adopted additional laws and regulations affecting project-related GHG emissions, as discussed below.

Assembly Bill 398 – Extension of Cap-and-Trade

On July 25, 2017 former Governor Jerry Brown signed into law AB 398, which reauthorizes the continuation of the Cap-and-Trade Program through December 31, 2030.

Association of Irritated Residents v. Kern County Board of Supervisors (2017) 17 Cal.App.5th 708

Following the County's certification of the 2016 EIR, in *Association of Irritated Residents v. Kern County Board of Supervisors, et al.* (2017) 17 Cal.App.5th 708 ("*AIR*"), the Court of Appeal held that CEQA authorized a lead agency to reduce the volume of a project's estimated GHG emissions to reflect the use of Cap-and-Trade compliance instruments when assessing the significance of a project's GHG emissions. Specifically, the *AIR* court held that, for purposes of CEQA Guidelines section 15064.4(b)(2), the Cap-and-Trade Program qualifies as a statewide regulatory program for the reduction of GHG emissions and CEQA thus authorizes a lead agency "to determine a project's GHG emissions will have a less than significant effect on the environment based on a project's compliance with the cap-and-trade program." On January 31, 2018, the Supreme Court declined review of the *AIR* decision. Therefore, *AIR* is controlling law.

AB 32 Scoping Plan Update

In December 2017, CARB adopted California's 2017 Climate Change Scoping Plan (2017 Scoping Plan*)* for public review and comment (CARB, 2017). The 2017 Scoping Plan builds on the successful framework established in the initial Scoping Plan and First Update, while identifying new technologically feasible and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target as established by SB 32 and define the state's climate change priorities to 2030 and beyond. The strategies' known commitments include implementing renewable energy and energy efficiency (including the mandates of SB 350), increasing stringency of the, implementing measures identified in the Mobile Source and Freight Strategies, implementing measures identified in the proposed Short-Lived Climate Pollutant Plan, and increasing stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve

the 2030 target, it recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20 percent.

The Supreme Court has determined that a Scoping Plan is not self-implementing (i.e., is not a regulation), and in the *Newhall* case described above the Supreme Court further concluded that consistency with Scoping Plan overall targets is not an appropriate threshold of significance for determining CEQA impacts, notwithstanding arguments presented to the Court in that case that CEQA requires either a "net zero" GHG emissions significance threshold or the unlegislated Executive Order 2050 target significance threshold.

California Code of Regulations Title 24

The current Title 24 standards are the 2016 Title 24 Building Energy Efficiency Standards, which became effective January 1, 2017, following certification of the 2016 EIR. The 2019 Title 24 Building Energy Efficiency Standards, which will be effective January 1, 2020, will further reduce energy used and associated GHG emissions compared to current standards. In general, single-family residences built to the 2019 standards are anticipated to use approximately 7 percent less energy due to energy efficiency measures than those built to the 2016 standards; further, as newly mandated state standards requiring rooftop solar electricity generation is factored in, single-family residences built under the 2019 standards will use approximately 53 percent less energy than those built under the 2016 standards (CEC, 2018). Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30 percent less energy than those built to the 2016 standards (CEC, 2018). The 2016 EIR did not include the reduced energy consumption or corresponding reduced air pollutant emissions from compliance with the 2019 Building Code, which become effective on January 1, 2020, or the newly mandated state standards requiring rooftop solar electricity generation.

California Code of Regulations Title 23, Article 22.5

California extended emergency water conservation regulations based on ongoing and projected future drought conditions caused or exacerbated by climate change.

California Code of Regulations Title 17

CARB adopted amendments to regulations implementing the Cap-and-Trade Program in 2017, consistent with and in furtherance of AB 398's extension of the Cap-and-Trade Program discussed above.

California Code of Regulations Title 14, Chapter 3

The Natural Resources Agency and OPR adopted updated CEQA Guidelines in December 2018. The updated guidelines did not change the guidelines or Appendix G (often used as default CEQA significance standards) relating to GHG. The guidelines did adopt new CEQA provisions regarding VMT as CEQA impacts as of July 1, 2020, based on the relationship between VMT and health benefits of encouraging drivers to walk or bike instead of drive, the wear and rainwater runoff that occurs on roads and highways, and air pollutant emissions (including GHG) from avoided vehicle travel when VMT is reduced. The OPR also issued non-binding guidance documents relating to VMT and GHG.

Executive Order B-37-16

Issued May 2016, EO B-37-16 directs the State Water Resources Control Board (SWRCB) to adjust emergency water conservation regulations through the end of January 2017 to reflect differing water supply conditions across the state. The SWRCB must also develop a proposal to achieve a mandatory reduction of potable urban water usage that builds off the mandatory 25 percent reduction called for in EO B-29-15. The SWRCB and Department of Water Resources will develop new, permanent water use targets that build upon the existing state law requirements that the state achieve 20 percent reduction in urban water usage by 2020. EO B-37-16 also specifies that the SWRCB will permanently prohibit water-wasting practices such as hosing off sidewalks, driveways, and other hardscapes; washing automobiles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water feature; watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation; and irrigating ornamental turf on public street medians.

Executive Order B-40-17

EO B-40-17 (April 2017) lifted the drought emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne. It also rescinds EO B-29-15, but expressly states that EO B-37-16 remains in effect and directs the SWRCB to continue development of permanent prohibitions on wasteful water use.

Executive Order B-55-18

EO B-55-18 (September 2018) establishes a statewide policy for the state to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the state's GHG emissions. CARB will work with relevant state agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

Local

Kern Council of Governments (Kern COG)

2014 Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS)

The Kern Council of Governments (Kern COG) 2014 RTP includes an SCS component in accordance with SB 375, the Sustainable Communities and Climate Protection Act of 2008 (Kern COG, 2014). The Kern COG Board of Directors adopted its first SCS on June 19, 2014, and made a determination that, if implemented, the SCS would achieve the per capita passenger vehicle GHG emissions targets established by the board of directors. The 2020 target is a 5 percent per capita reduction and the 2035 target is a 10 percent per capita reduction from the 2005 base year. Kern COG submitted its adopted SCS and GHG determination to CARB for review on June 4, 2015. On July 24, 2015, CARB accepted the determination that the Kern COG 2014 SCS, if implemented, would achieve the region's per capita GHG emission reduction targets for 2020 and 2035.

The SCS strives to reduce air pollutant emissions from passenger vehicle and light-duty truck travel by better coordinating transportation expenditures with forecasted development patterns and, if feasible, help meet CARB GHG targets for the region. SB 375 requires CARB to develop regional GHG emission reduction targets for passenger vehicles. CARB is to establish targets for the automobile and light-duty truck sector for 2020 and 2035 for each region covered by one of the

state's 18 metropolitan planning organizations. Regional metropolitan planning organizations are responsible for preparing an SCS within their RTP. The key purpose of SB 375 and the Kern COG SCS is to reduce per capita emissions originating from passenger vehicles and light-duty trucks. Accordingly, the 2014 RTP:

- Describes sources of emissions in the Kern region, 2020 and 2035 emission reduction targets established by CARB for the San Joaquin Valley, and modeling techniques used to estimate and forecast emissions
- Identifies statewide strategies to reduce transportation-related emissions and their anticipated effect within the Kern region
- Identifies regional strategies that complement the SCS by reducing emissions in other sectors (e.g., energy consumption)
- Quantifies the effect of policies and programs in the RTP that reduce transportation-related emissions in the region and
- Compares the emissions reductions anticipated with implementation of the SCS with the regional targets. (Kern COG, 2014)

The GHG emission targets for lowering emissions in the San Joaquin Valley, as set by CARB and approved by the Kern COG Board of Directors, call for a 5 percent reduction in per capita emissions from passenger vehicles and light trucks by 2020 and a 10 percent reduction by 2035 through land use and transportation planning. Based on the analysis of strategies included in the SCS, CO_2 emissions are anticipated to be 14.1 percent lower than 2005 levels by 2020 and 16.6 percent lower by 2035, exceeding the targets established by CARB in 2010 (Kern COG, 2014).

RTP/SCS Update Adopted Since the 2016 Certification of the EIR

Following the 2016 certification of the Grapevine EIR, the Kern COG adopted the Regional Transportation Plan/Sustainable Communities Strategy (2018 RTP/SCS) for Kern County, which is required to be prepared under applicable transportation, air quality, and GHG reduction laws. The 2018 RTP/SCS designates the Grapevine Project site and adjacent locations, including the existing Tejon Ranch Commerce Center as a "Planned Transit Priority Area" and a "Strategic Employment Center." These designations identify the project area as an activity node around which future transit, vanpooling services, and mixed-use development patterns would occur as part of the forecasted development patterns within the Kern COG planning region. The RTP/SCS designation recognizes that the project incorporate a land use pattern and corresponding transportation network that encourages the location of housing near jobs and transportation facilities designed to reduce regional passenger vehicle travel and reduced vehicular air pollutant emissions.

San Joaquin Valley Air Pollution Control District (SJVAPCD)

The SJVAPCD does not regulate GHG emissions directly through its permitting responsibilities for stationary sources. Thus, there are no SJVAPCD rules or regulations related to GHGs. The SJVAPCD, however, effects reductions of GHGs from new and modified stationary sources when acting as a Lead Agency for CEQA. The SJVAPCD implements its GHG policies and reviews whether new or modified stationary sources will implement best performance standards (BPS). In 2009, the SJVAPCD reviewed potential GHG significance thresholds and approaches suggested by or adopted by the following entities, ranging from quantification of a project's GHG impacts

without a recommended significance threshold to a zero threshold to specific significance thresholds for different kinds of projects (e.g., residential, mixed use, industrial, plans).

On December 17, 2009, the SJVAPCD Governing Board adopted *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* (SJVAPCD, 2009). The guidance recommends the following hierarchy for evaluating a project's impact with respect to its GHG emissions:

Projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the Lead Agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the Lead Agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS.

Projects implementing BPS would not require quantification of project specific GHG emissions. The guidance recommends, "Projects requiring preparation of an Environmental Impact Report for any other reason would require quantification of project specific GHG emissions." This assessment for the project does include quantification of the project's construction and operational GHG emissions. Consistent with the state CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Projects not implementing BPS would require quantification of project specific GHG emissions and demonstration that project specific GHG emissions would be reduced or mitigated by at least 29 percent, compared to BAU, including GHG emission reductions achieved since the 2002–2004 baseline period. Projects achieving at least a 29 percent GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG (SJVAPCD, 2009).

For development projects, BPS would include project design elements, land use decisions, and technologies that reduce GHG emissions. While the SJVAPCD has adopted BPS for several types of stationary sources (e.g., boilers), it has not developed BPS for land development projects. Projects implementing any combination of BPS, and/or demonstrating a total 29 percent reduction in GHG emissions from BAU, would be determined to have a less than significant individual and cumulative impact on global climate change (SJVAPCD, 2015).

Kern County

Kern County has not adopted a GHG reduction plan or climate action plan as of this publication of this EIR.

Kern County General Plan (KCGP)

The project site is located within the Kern County General Plan (KCGP). The policies, goals, and implementation measures in the KCGP applicable to GHGs as related to the project are provided in Chapter 4.3, *Air Quality*. Some of the listed policies, goals, and implementation measures would indirectly impact GHG emissions through the reduction of fossil fuel use.

Chapter 1: Land Use, Open Space, and Conservation Element

Section 1.10.2 Air Quality

Policies

- **Policy 18:** The air quality implications of new discretionary land use proposals shall be considered in approval of major developments. Special emphasis will be placed on minimizing air quality degradation in the desert to enable effective military operations and in the valley region to meet attainment goals.
- **Policy 19:** In considering discretionary projects for which an environmental impact report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision-making body, as part of its deliberations, will ensure that:
  a) All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and
  b) The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.
- **Policy 21:** The County shall support air districts' efforts to reduce PM_{10} and $PM_{2.5}$ emissions.

Implementation Measures

- **Measure F:** All discretionary permits shall be referred to the appropriate air district for review and comment.
- **Measure G:** Discretionary development projects involving the use of tractor-trailer rigs shall incorporate diesel exhaust reduction strategies, including, but not limited to:
  a. Minimizing idling time, and
  b. Electrical overnight plug-ins.
- **Measure H:** Discretionary projects may use one or more of the following to reduce air quality effects:
  a. Pave dirt roads within the development,
  b. Pave outside storage areas,
  c. Provide additional low volatile organic compound–producing trees on landscape plans,
  d. Use alternative fuel fleet vehicles or hybrid vehicles,
  e. Use emission control devices on diesel equipment,
  f. Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency–certified low-emission natural gas fireplaces,
  g. Provide bicycle lockers and shower facilities on-site,
  h. Increase the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86),
  i. Use and develop park-and-ride facilities in outlying areas, and
  j. Other strategies that may be recommended by the local Air Pollution Control Districts.
- **Measure J:** The County should include PM_{10} control measures as conditions of approval for subdivision maps, site plans, and grading permits.

Chapter 5: Energy Element

Section 5.4.5 Solar Energy Development

Goal

Encourage safe and orderly commercial solar development.

Policy

- **Policy 1:** The County shall encourage domestic and commercial solar energy uses to conserve fossil fuels and improve air quality.

4.7.4 Supplemental Recirculated EIR (SREIR) New and Updated Analysis

Methodology

This subsection discusses the preparation and analysis of the new material developed for the SREIR to provide a common basis for analyzing potential project development scenarios with lower internal capture rates (ICRs) and/or higher vehicle miles travelled (VMT), which are collectively referred to as Reduced ICR Scenarios, than were considered in the FEIR (2016). The primary purpose of the Updated 28.7% HBW ICR is to update the FEIR (2016) analysis with more current information published after the FEIR was certified in 2016, including the tenth edition of the Institute of Transportation Engineers (ITE) Manual in 2017 and the current version of CalEEMod, as discussed below. The ITE Manual provides widely utilized trip generation rates for specific land uses, such as housing or commercial development. As shown in Table 4.16-9 in Chapter 4.16, *Transportation and Traffic*, total project trips using the more current, tenth edition of the ITE Manual are slightly lower than generated by the ninth edition of the ITE Manual used in the FEIR (2016) analysis. The lower number of total trips generated by using the tenth edition of the ITE Manual also results in a slight decrease in weekday VMT compared with the FEIR (2016).

The Updated 28.7% HBW ICR, which incorporates the 2017 ITE Manual, was then used as the baseline for screening the 22 potential project development scenarios and identifying the Reduced ICR Scenarios for more detailed analysis. The potential project development scenarios, the screening process for the scenarios, and the potential impacts associated with development scenarios with lower ICRs and higher VMT than those considered in the FEIR (2016) are discussed in detail in the SREIR, Section 4.16.4 (Volume. 1).

CalEEMod Version 2016.3.2

At the time the 2016 EIR was prepared and certified, the current version of the CalEEMod software was CalEEMod Version 2013.2.2. Subsequently, various model and emission factor updates and bug fixes occurred when updating CalEEMod from Version 2013.2.2 to Version 2016.3.2. Of particular importance, CalEEMod Version 2016.3.2 assumes development compliance with 2016 Title 24, Part 6, Building Energy Efficiency Standards, updated mobile source emission factors, updated the GWP values, and fixed a software bug that did not calculate all mobile source mitigation measures. CalEEMod Version 2016.3.2 was used for this supplemental GHG emissions analysis, as discussed further in Section 2.5.2 of the 2019 Air Study, and consistent with the direction of the SJVAPCD in scoping comments submitted in response to the NOP in May 2019.

Since the 2016 EIR was certified, additional mitigation measures were identified as feasible emission reduction strategies and are incorporated into the project to reduce potential GHG emissions impacts, as described herein. To the extent that these mitigation measures are quantifiable using CalEEMod, the emission reductions associated with the additional mitigation measures have been included in the quantified supplemental analysis. However, no reductions to estimated emissions were made due to new or updated regulations adopted after certification of the 2016 EIR, although such reductions may be included in future versions of CalEEMod. In addition, the fleet mix in CalEEMod was tailored by land use to reflect the anticipated motor vehicle characteristics associated with the land use development mix (e.g., greater proportion of automobiles and light-duty vehicles for residential uses and a greater proportion of heavy-duty trucks for industrial uses), as discussed in the 2019 Air Study.

Due to the emission estimator model updates and identification of additional mitigation measures, the emissions estimated in the 2016 EIR do not represent an appropriate comparison to the emissions estimated for the project assuming reduced ICR levels. To provide an apples-to-apples comparison between the project as evaluated in the FEIR (2016), on the one hand, and the five additional reduced ICR and/or higher VMT (Reduced ICR Scenarios A through E) scenarios, on the other hand, an updated 28.7% HBW ICR scenario for the project was modeled. The Updated 28.7% HBW ICR scenario is the project as analyzed in the FEIR, (2016) but using CalEEMod Version 2016.3.2 and updating it consistent with the other Reduced ICR Scenarios analyzed herein. The Updated 28.7% HBW ICR Scenario is further explained in Sections 2.5 and 3.5 of the 2019 Air Study.

Reduced ICR Scenarios

This section considers the potential project GHG emissions impacts that could be associated with lower ICRs and/or higher VMT levels than considered in the DEIR (2016) and FEIR (2016), as described in the NOP. To identify a range of potential scenarios that could result in higher VMT compared to the project, a total of 22 Screening Scenarios were developed by the project traffic consultant, Fehr & Peers, to evaluate how daily, AM, and PM peak hour trip generation rates and VMT could vary with ICRs that were 10 and 20 percent lower than used in the 2016 EIR or from other identified development patterns, such as primarily residential or commercial/light industrial development, that could also affect project VMT. As described in the 2019 Traffic Study, none of the scenarios were found to generate a greater amount of daily average and peak hour trips than identified in the 2016 EIR and five of the scenarios were found to generate higher levels of VMT than in the 2016 EIR. Vehicular emissions are partially dependent on project VMT, so these five Reduced ICR Scenarios are evaluated in this section. The five Reduced ICR Scenarios A through E, described above and restated below for ease of reference are assessed quantitatively in this section:

(a) **Scenario A.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 100 percent of full buildout with a 10 percent reduction in the daily and peak hour ICRs used in the 2016 EIR

(b) **Scenario B.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 100 percent of full buildout with a 20 percent reduction in the daily and peak hour ICRs used in the 2016 EIR

(c) **Scenario C.** Proposed project development of 12,000 dwelling units and 5,100,000 square feet of commercial/light industrial uses at 75 percent of full buildout (9,000 dwelling units and 3,185,000 square feet of commercial/light industrial uses) with a 20 percent reduction in the daily and peak hour ICRs used in the 2016 EIR

(d) **Scenario D.** Development of 14,000 dwelling units and schools and parks as required by applicable land use laws and regulations, with no complementary commercial/light industrial amenities or on-site employment-generating land uses

(e) **Scenario E.** Development of 12,000 dwelling units and schools and parks as required by applicable land use laws and regulations, with no complementary commercial/light industrial amenities or on-site employment-generating land uses

The scope of this supplemental GHG emissions analysis is to provide a comparison of potential impacts under CEQA that would potentially change as a result of the higher projected VMT for the five analyzed scenarios, and associated changes to mobile source emissions. Accordingly, this evaluation estimates operational GHG emissions from land use operation and stationary sources based on traffic volume and trip distribution changes associated with each of the five scenarios included in the 2019 Traffic Study, consistent with the NOP.

Thresholds of Significance

As discussed in Chapter 2, *Introduction*, the County determined that the thresholds of significance used in the 2016 EIR do not require modification to address the 2018 revisions to CEQA Appendix G. Accordingly, the Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have significant impacts on GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Further, while the project would result in emissions of GHGs during construction and operation, in general an individual project is of insufficient magnitude by itself to influence global climate change or result in a substantial contribution to the global GHG inventory. GHG impacts are recognized as exclusively cumulative impacts. The level of GHG emissions that would be considered substantial enough to result in a significant adverse impact on global climate and thus be considered cumulatively considerable needs to be defined.

This SREIR GHG emissions analysis addresses the following threshold:

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

This SREIR GHG emissions analysis does not address the following thresholds, which are not relevant to the updated emissions estimates:

- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs

The following GHG emissions analysis topics that were addressed in the 2016 EIR, but would not change as a result of this evaluation include, but is not limited to, the following:

- Construction emissions

Project Impacts

Impact 4.7-1: Generate Greenhouse Gas Emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment

As discussed in the 2016 EIR, the project would result in GHG emissions during both construction and operations. This GHG emissions analysis evaluates and compares GHG emissions for the project as analyzed in the 2016 EIR, the Updated 28.7% HBW ICR Scenario, and for the five lower ICR/higher VMT scenarios identified in the 2019 TIA as described above. Construction-related GHG was not within the scope of the analysis of modified ICR as described in the NOP.

Project-generated emission sources are grouped into the following emission source categories, as explained below: area, energy, mobile, solid waste, water/wastewater, and stationary. As explained in SREIR Section 3.4.4, the ICR reduction scenarios and the higher VMT scenarios only affects the mobile source emission quantification. However, due to CalEEMod updates (discussed above) and incorporation of additional mitigation measures resulting from CalEEMod updates (discussed below), area, energy, solid waste, and water/wastewater emission estimates also changed for the Updated 28.7% HBW ICR Scenario and five Reduced ICR Scenario analyses. In addition, the land use changes (i.e., type and/or amount of each land use) associated with the Reduced ICR Scenarios (Scenarios 4, 9, and 10) result in changes in estimated emissions for all emission sources (i.e., area, energy, mobile, solid waste, water/wastewater, and stationary). While not as substantial of a variable, the land use inputs for the Updated 28.7% HBW ICR Scenario, Scenario A, and Scenario B are slightly different than assumed for the 2016 EIR to provide a consistent land use mix and amount as assumed in the 2019 TIA.

CalEEMod was used to estimate the potential unmitigated and mitigated operational GHG impacts of the Updated 28.7% HBW ICR Scenario for the following emission sources: area sources, energy sources, mobile sources, solid waste, water and wastewater, and stationary sources. With respect to the Updated 28.7% HBW ICR Scenario's mitigated operational GHG emissions, only modified mitigation measure MM-4.7-4, (Energy Conservation), and new mitigation measures MM-4.7-5, (Exterior Lighting Plan), MM-4.7-6, (On-Site Renewable Energy), MM-4.7-7, (Energy Efficient Appliances), and MM-4.3-9 (Internet Infrastructure and Telecommuting), can be and were calculated as GHG emission reductions using CalEEMod; the remainder of the new mitigation measures will reduce GHG emissions, but the reductions are not quantifiable in CalEEMod version 2016.3.2. Mitigation measures quantified in the 2016 EIR were also quantified in this analysis. Sections 3.5.2 through 3.5.4 of the 2019 Air Study describe in detail in the methodology used to estimate the Updated 28.7% HBW ICR Scenario's potential unmitigated and mitigation operational GHG impacts.

Unmitigated Emissions

Table 4.7-1, *Estimated Annual Unmitigated Operational Greenhouse Gas Emissions*, shows that, at buildout, the project's estimated annual unmitigated operational GHG emissions would be approximately 379,086 MT CO_2e per year.

Table 4.7-1. Estimated Annual Unmitigated Operational Greenhouse Gas Emissions – Updated 28.7% HBW ICR Analysis

	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.31	0.24	0.10	5,378.68
Energy	44,183.15	2.31	0.75	44,465.63
Mobile	313,728.38	9.81	0.00	313,973.55
Solid Waste	1,197.97	70.80	0.00	2,967.92
Water Supply and Wastewater	1,435.04	0.11	0.02	1,444.71
Stationary	—	—	—	12,300.00
Total Annual Emissions				379,085.78

Source: Dudek, 2019a.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual unmitigated operational mobile source GHG emissions by air basin for the Updated 28.7% HBW ICR Scenario are presented in Table 4.7-2.

Table 4.7-2. Estimated Annual Unmitigated Operational Mobile Greenhouse Gas Emissions by Air Basin – Updated 28.7% HBW ICR Analysis

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	220,362.81	6.89	0.00	220,535.02
MDAB	27,608.10	0.86	0.00	27,629.67
SCAB	65,757.47	2.06	0.00	65,808.86

Source: Dudek, 2019a.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Mitigated Emissions

A summary of the mitigation measures quantified in CalEEMod is set forth in Table 3.5-3 of the 2019 Air Study, and both mitigation measures quantified in CalEEMod and mitigation measures not yet quantified in CalEEMod are included at the end of this section. Mitigation measures to reduce other project impacts, such as air quality and transportation, also reduce GHG emissions, as further explained below.

A full description of each measure is set forth below.

For energy emissions, quantified measures include MM-4.7-4 (Energy Conservation), MM-4.7-5 (Exterior Lighting Plan), MM-4.7-6 (On-Site Renewable Energy), and MM-4.7-7 (Energy Efficient Appliances). For mobile emissions, quantified measures include MM-4.7-2 (Greenhouse Gas Emission Reduction Measures) and MM-4.3-9 (Internet Infrastructure and Telecommuting).

Notably, there are a number of new additional mitigation measures that pertain to supporting alternative fueled and EV use in the project area, including MM-4.3-10 (Mobility Plan), MM-4.3-13 (Preferential Parking and Electric Vehicle Charging for Nonresidential Buildings), MM-4.3-14 (Multi-Family Residential and Park/Trail Parking), MM-4.3-15 (Residential Parking), MM-4.3-16 (Electric Vehicle Charging and Incentive), and MM-4.3-17 (Electric Vehicles), as described below. These new mitigation measures will support critical linkages for the usage of EVs at the project,

and research shows that consumer incentives and the availability of EV infrastructure (i.e., public charge points and workplace charging) result in increased EV usage (Dudek, 2019a). Increased EV usage would decrease both the exhaust criteria air pollutants and GHGs generated by the combustion of fossil fuels for on-road vehicle operation. However, reductions associated with these measures were not quantified, and therefore, the mitigated GHG emissions inventory for the Updated 28.7% HBW ICR Scenario is considered a conservative estimate. Estimated annual mitigated operational GHG emissions for the Updated 28.7% HBW ICR Scenario are presented in Table 4.7-3, *Estimated Annual Mitigation Operational Greenhouse Gas Emissions – Updated 28.7% HBW ICR Scenario Analysis*.

Neither the 2016 EIR nor the SREIR separately quantified GHG emission reductions from traffic mitigation measures designed to reduce automobile use, but not converted into VMT reductions by Fehr & Peers, such as MM-4.16-2, MM-4.16-4, and MM-4.16-9. Similarly, the revised mitigation measures recommended in the 2019 Traffic Study have not been quantified as VMT reductions with corresponding GHG emission reductions. Since measures to reduce automobile use do reduce GHG emissions, the quantified GHG emission calculations in this report continue to be conservative (i.e., likely overstate VMT and VMT-related [mobile source] emissions).

Project impacts reduced by GHG mitigation measures quantified in CalEEMod are presented in consecutive order below for the Updated 28.7% HBW ICR Scenario and the five other Reduced ICR Scenarios, to provide a more concise comparative framework in this SREIR for comparing the GHG emissions for each project scenario.

Table 4.7-3. Estimated Annual Mitigated Operational Greenhouse Gas Emissions – Updated 28.7% HBW ICR Analysis

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.31	0.24	0.1	5,378.68
Energy	28,870.14	1.26	0.50	29,051.30
Mobile	287,214.91	9.26	0.00	287,446.40
Solid Waste	1,197.97	70.80	0.00	2,967.92
Water Supply and Wastewater	1,435.04	0.11	0.02	1,444.71
Stationary	—	—	—	12,300.00
Total Annual Emissions				338,589.01

Source: Dudek, 2019a.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

As shown in Table 4.7-3, estimated annual mitigated operational GHG emissions for the Updated 28.7% HBW ICR Scenario would be approximately 338,589 MT CO_2e per year.

Estimated annual mitigated operational mobile source GHG emissions by air basin for the Updated 28.7% HBW ICR Scenario are presented in Table 4.7-4.

Table 4.7-4. Estimated Annual Mitigated Operational Mobile Greenhouse Gas Emissions by Air Basin – Updated 28.7% HBW ICR Analysis

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	201,739.75	6.50	0.00	201,902.35
MDAB	25,274.91	0.81	0.00	25,295.28
SCAB	60,200.25	1.94	0.00	60,248.77

Source: Dudek, 2016b.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

As explained above, the 2016 EIR and Updated 28.7% HBW ICR Scenario were modeled using different CalEEMod versions, methodology, and mitigation measures; therefore, they do not represent an appropriate comparison to the emissions calculated for the five reduced ICR/higher VMT scenarios analyzed in the 2019 Air Study. Nonetheless, to demonstrate the magnitude in difference in emissions from the 2016 EIR and Updated 28.7% HBW ICR Scenario approach and methodology, the net change between the 2016 EIR and Updated 28.7% HBW ICR Scenario is presented in Table 4.7-5.

Table 4.7-5. Comparison of 2016 EIR and Updated 28.7% HBW ICR Scenario Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
Unmitigated	
2016 EIR	579,994.38
Updated 28.7% HBW ICR Scenario	380,530.33
Net Change (Updated 28.7% HBW ICR Scenario – 2016 EIR)	(199,464.05)
Mitigated	
2016 EIR	565,624.14
Updated 28.7% HBW ICR Scenario	338,589.01
Net Change (Updated 28.7% HBW ICR Scenario – 2016 EIR)	(227,035.13)

Source: Dudek, 2016a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent; 2016 EIR = Draft Environmental Impact Report; Numbers in parenthesis represent a negative number.

As shown in Table 4.7-5, the Updated 28.7% HBW ICR Scenario under unmitigated and mitigated conditions would result in a reduction in GHG emissions compared to the 2016 EIR (decrease in emissions between approximately 34 and 40 percent). A side-by-side comparison of the 2016 EIR and Updated 28.7% HBW ICR Scenario by emission source is presented in Table 4.7-6 to illustrate where the emission reductions occurred. Notably, the unmitigated 2016 EIR GHG emissions reflect business-as-usual conditions. As such, for water supply and wastewater, the unmitigated 2016 EIR analysis assumed that the project would not include recycled water and took no credit for GHG reductions associated with implementation of the state's RPS. For the Updated 28.7% HBW ICR Scenario, use of recycled water and implementation of RPS was assumed for both the unmitigated and mitigated scenarios. Similarly, for the 2016 EIR unmitigated solid waste emissions, the 2016

EIR assumed that the project would not divert any solid waste from a landfill under the business-as-usual conditions; however, for the Updated 28.7% HBW ICR Scenario analysis, the unmitigated GHG emissions assume compliance with AB 341, as explained in Section 3.5.4.4 of the 2019 Air Study. In addition to comparing GHG emissions for the 2016 EIR and Updated 28.7% HBW ICR Scenario, Table 4.7-6 also presents the difference in CO_2e emissions as shown as the difference in emissions and the difference as a percent change.

Table 4.7-6. Comparison of 2016 EIR and Updated 28.7% HBW ICR Scenario Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions By Emission Source

	CO_2e (Metric Tons Per Year)		Difference in CO_2e (Metric Tons Per Year)	
Source	*2016 EIR*	*Updated 28.7% HBW ICR Scenario*	*Emissions*	*Percent Change*
Unmitigated				
Area	5,378.87	5,378.68	(0.19)	0.00%
Energy	40,740.60	44,465.63	3,725.03	9.14%
Mobile	507,473.36	313,973.55	(193,499.81)	(38.13%)
Solid Waste	10,234.41	2,967.92	(7,266.49)	(71.00%)
Water Supply and Wastewater	3,867.14	1,444.71	(2,422.43)	(62.64%)
Stationary	12,300.00	12,300.00	0.00	0.00%
Total	579,994.38	380,530.33	(199,464.05)	(34.39%)
Mitigated				
Area	5,378.87	5,378.68	(0.19)	0.00%
Energy	36,468.76	29,051.30	(7,417.46)	(20.34%)
Mobile	507,473.36	287,446.40	(220,026.96)	(43.36%)
Solid Waste	2,558.60	2,967.92	409.32	16.00%
Water Supply and Wastewater	1,444.55	1,444.71	0.16	0.01%
Stationary	12,300	12,300.00	0.00	0.00%
Total	565,624.14	338,589.01	(227,035.13)	(40.14%)

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent; 2016 EIR = Draft Environmental Impact Report.
Numbers in parenthesis represent a negative number.

As shown in Table 4.7-6, area source GHG emissions resulted in a minor nominal change when comparing the 2016 EIR and Updated 28.7% HBW ICR Scenario. The Updated 28.7% HBW ICR Scenario increase in unmitigated energy GHG emissions compared to the 2016 EIR is likely due to the change in CalEEMod default energy demand values. In contrast, mitigated energy GHG emissions decreased in the Updated 28.7% HBW ICR Scenario compared to the 2016 EIR due to the incorporation of additional mitigation measures. As detailed in Section 3.4 of the 2019 Air Study, there was a reduction in estimated mobile source GHG emissions for the Updated 28.7% HBW ICR Scenario, as compared to the 2016 EIR, due to (1) the CalEEMod Version 2016.3.2 update in mobile source emission factors reflecting EMFAC Version 2014 (primarily CO_2) (See 2019 Air Study, Appendix B), and (2) the changes in fleet mix by land use and trip length by land use. In addition, CalEEMod Version 2016.3.2 corrected a software bug in CalEEMod Version 2013.2.2 that caused inaccurate estimates of VMT reductions associated with implementation of VMT-reducing mitigation measures, which contributes to the additional GHG emission reduction under the mitigated comparison. The estimated mobile source emission reduction of 193,500 MT CO_2e per year under unmitigated conditions and 220,027 MT CO_2e per year under mitigated conditions accounts for the majority of the emission reductions between the Updated 28.7% HBW

ICR Scenario and the 2016 EIR (approximately 97 percent of the total GHG emission reductions under unmitigated and mitigated conditions).

For solid waste and water/wastewater emissions, while the 2016 EIR resulted in greater GHG emissions compared to the Updated 28.7% HBW ICR Scenario under unmitigated conditions, the 2016 EIR unmitigated emissions reflect business-as-usual conditions and is thus not an apples-to-apples comparison. Mitigated emissions, however, do represent an apples-to-apples comparison for both solid waste and water/wastewater emissions. Under mitigated conditions, the Updated 28.7% HBW ICR Scenario results in slightly greater GHG emissions from solid waste associated with the change in GWP values and minor changes in land use inputs. For water supply and wastewater, under mitigated conditions, the nominal change in GHG emissions is associated with the GWP values. For stationary sources, which were estimated outside of CalEEMod in a spreadsheet model, no changes in methodology occurred and therefore, no changes to stationary source GHG emissions occurred between the 2016 EIR and Updated 28.7% HBW ICR Scenario.

As the Supreme Court recognized in Newhall, "because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself. The challenge for CEQA purposes is to determine whether the impact of the project's emissions of GHGs is cumulatively considerable[.]" Table 4.7-6 and the 2019 Air Study demonstrate that the project would generate substantially fewer GHG emissions than estimated in the 2016 EIR. As discussed in the 2016 EIR and in the 2019 Air Study, the project will comply and be consistent with an extensive list of applicable regulatory programs designed to reduce GHG emissions and will thus contribute to the achievement of California's and AB 32's GHG reduction goals. Most importantly, for purposes of this analysis, the project will comply and be consistent with the Cap-and-Trade Program. The project's anticipated GHG emission sources covered by the Cap-and-Trade Program are presented in Table 4.7-7.

Table 4.7-7. Anticipated Project-Generated Greenhouse Gas Emission Sources Covered by Cap-and-Trade Program

Emission Source	GHG Emission Source Examples	Covered by the Cap-and-Trade Program?
Area	Landscape maintenance equipment fuel combustion	Yes
	Natural gas combustion for fireplaces	Yes
Energy	Natural gas fuel combustion (e.g., space and water heaters)	Yes
	Fuel combustion for electrical power production	Yes
Mobile	Transportation fuel combustion for vehicle travel	Yes
Solid Waste	Landfill decomposition	No
Water Supply and Wastewater	Electrical power production for water supply, treatment, and distribution	Yes
	Electrical power production for wastewater treatment	Yes
	Biogas recovered from treatment process	No
Stationary	Natural gas fuel combustion and fuel combustion for electrical power production	Yes

As shown in Table 4.7-7, because emissions from major GHG-emitting sources, such as electricity generation, fuel distributors (e.g., natural gas and transportation fuels), and large stationary sources are capped under the Cap-and-Trade Program, almost all of the project would be subject to the cap-and-trade regulations. In accordance with SJVAPCD Policy APR-2015 and consistent with *Association of Irritated Residents v. Kern County Board of Supervisors, et al.* (2017) 17 Cal.App.5th 708, the project's GHG emissions, which are nearly all covered by cap-and-trade, could therefore be considered less than significant and therefore not cumulatively considerable.

However, many measures incorporated in the SREIR analysis are regional or statewide in nature and do not provide a mechanism that guarantees GHG emission reductions on a cumulative basis. In addition, Kern County does not have the jurisdictional authority to control the various cumulative sources of GHGs in the County, or the GHG emissions from sources around the globe, which all contribute to climate change. Although many other agencies with the necessary jurisdiction are currently taking action to reduce GHG emissions, the County cannot assure that these measures would ultimately be implemented or sufficient to address climate change and, therefore, the project's GHG emissions would be considered cumulatively considerable under SREIR projections even with implementation of the mitigation measures described in Section 4.7.4.4.

Reduced ICR Scenarios Analysis

This section discusses the Reduced ICR Scenarios analysis developed in the 2019 Air Study and 2019 Traffic Study to consider potential GHG impacts from project development that could occur under lower ICR conditions than considered in the 28.7% HBW ICR considered in the FEIR (2016).

Higher VMT Scenario Development

To identify a range of potential scenarios that could result in greater VMT compared to the project, the 2019 Traffic Study developed a total of 22 Screening Scenarios to evaluate how daily AM and PM peak hour trip generation rates and VMT could vary with ICRs that were 10 and 20 percent lower than used in the 2016 EIR or from other identified development patterns, such as primarily residential or commercial/light industrial development, that could also affect project VMT. As described in the 2019 Traffic Study, none of the scenarios were found to generate a greater amount of daily average and peak hour trips than identified in the FEIR (2016) or this supplemental analysis. Five of the lower ICR scenarios were found to generate higher levels of VMT than in the FEIR (2016) and the Updated 28.7% HBW ICR Scenario analysis. Vehicular emissions evaluated herein are partially dependent on project VMT, so five Reduced ICR Scenarios were also evaluated in the 2019 Air Study. Lower VMT scenarios, such as partial buildout of only a portion of the project (e.g., 3,000, 6,000, or 9,000 units), were not quantified in the 2019 Air Study because such partial buildout scenarios would result in lower VMT, and thus GHG emissions that are lower than those calculated in the FEIR (2016). The five higher VMT scenarios identified in the 2019 Traffic Study, and assessed quantitatively in this report, include Reduced ICR Scenarios A through E as previously presented above.

The scope of this scenario analysis is to provide a comparison of potential impacts under CEQA that would potentially change as a result of the higher projected VMT for the five analyzed scenarios, and associated changes to mobile source emissions. Accordingly, this evaluation estimates operational GHG emissions from land use operation (i.e., non-permitted activities) and stationary sources (permitted equipment and activities) associated with each of the five Reduced ICR Scenarios included in the 2019 Traffic Study and 2019 Air Study. The scope of the analysis is further defined in Sections 2.4 and 3.4 of the 2019 Air Study.

Because CalEEMod emission calculations are driven by land use types, a summary of the two most significant land use categories in each of the five scenarios is set forth in Table 4.7-8.

Table 4.7-8. Scenario Overview		
Scenario	Total Residential (Units)	Total Non-Residential (Square Feet)
Scenario A	12,000	5,100,000
Scenario B	12,000	5,100,000
Scenario C	9,000	3,825,000
Scenario D	14,000	0
Scenario E	12,000	0
Source: 2019 Traffic Study. Notes: Full buildout in year 2036 assumed.		

As explained previously, the driver for this SREIR analysis is to evaluate the potential changes in GHG emissions associated with changes in project-generated VMT under different buildout scenarios. Accordingly, a summary of the estimated VMT by scenario and the Updated 28.7% HBW ICR Scenario is presented in Table 4.7-9, which shows the estimated weekday VMT estimated by the 2019 Traffic Study, as well as the estimated mitigated and unmitigated annual VMT estimated in CalEEMod. Please see 2019 Air Study Table 2.5-9 for a list of the mitigation assumed in the mitigated annual VMT estimate. The estimated VMT for the 2016 EIR analysis is also presented in Table 4.7-9 for disclosure purposes. As shown, the estimated weekday and annual VMT for the 2016 EIR was less than the Updated 28.7% HBW ICR Scenario and all scenarios analyzed herein. However, when taking into account CalEEMod software updates, incorporation of additional mitigation measures, emission calculation methodology updates, and for some scenarios, changes to land use mix, an increase in VMT does not automatically result in an increase in GHG emissions. The estimated GHG emissions by scenario are assessed in this section to evaluate how changes in land use buildout would result in changes in estimated emissions when considering differences in VMT and other key variables previously discussed.

Table 4.7-9. Vehicle Miles Traveled Overview			
Scenario	2019 Traffic Study Estimated Unmitigated Weekday VMT	CalEEMod Calculated Unmitigated Annual VMT	CalEEMod Calculated Mitigated Annual VMT
2016 EIR	2,595,690	891,723,339	843,410,997
Updated 28.7% HBW ICR Scenario	3,114,939	1,085,502,495	990,274,668
Scenario A	3,881,511	1,355,360,536	1,236,583,830
Scenario B	4,587,395	1,604,111,279	1,463,584,876
Scenario C	3,440,599	1,203,085,012	1,097,690,044
Scenario D	4,336,327	1,561,843,760	1,435,264,903
Scenario E	3,716,852	1,338,723,784	1,230,227,560
Notes: VMT = vehicle miles traveled; 2016 EIR = Draft Environmental Impact Report.			

Scenario A

Scenario A assumes that the project will be entitled for the development of 12,000 dwelling units and 5.1 million square feet of nonresidential land uses with a 10 percent reduction in internalized trips. Scenario A involves the same land use breakdown as the Updated 28.7% HBW ICR Scenario, but with this different ICR assumption, which results in higher VMT and associated mobile source emissions. The land use inputs for Scenario A that were modeled in CalEEMod are shown in Table 2.6-3 of the 2019 Air Study. The Scenario A GHG emissions calculation methodology is described in Section 3.6.1.2 of the 2019 Air Study.

Estimated Unmitigated Emissions – Scenario A

Estimated annual unmitigated operational GHG emissions for Scenario A would be approximately 449,702 MT CO_2e, as shown in Table 4.7-10.

Table 4.7-10. Estimated Annual Unmitigated Operational Greenhouse Gas Emissions – Scenario A

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,44.31	0.24	0.10	5,378.68
Energy	44,183.14	2.31	0.75	44,465.63
Mobile	382,862.61	11.33	0.00	383,145.10
Solid Waste	1,197.97	70.80	0.00	2,967.92
Water Supply and Wastewater	1,435.04	0.11	0.02	1,444.71
Stationary	—	—	—	12,300.00
Total Annual Emissions				449,702.04

Source: Dudek 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual unmitigated operational mobile source GHG emissions by air basin for Scenario A are presented in Table 4.7-11.

Table 4.7-11. Estimated Annual Unmitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario B

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	267,620.96	7.92	0.00	267,818.42
MDAB	34,074.77	1.01	0.00	34,099.91
SCAB	81,166.87	2.40	0.00	81,226.76

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.

Estimated Mitigated Emissions – Scenario A

As shown in Table 4.7-12, estimated annual mitigated operational GHG emissions for Scenario A would be approximately 401,671 MT CO_2e.

Table 4.7-12. Estimated Annual Mitigated Operational Greenhouse Gas Emissions – Scenario A

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.31	0.24	0.1	5,378.68
Energy	28,870.14	1.26	0.50	29,051.30
Mobile	350,262.05	10.65	0.00	350,528.39
Solid Waste	1,197.97	70.80	0.00	2,967.92
Water Supply and Wastewater	1,435.04	0.11	0.02	1,444.71
Stationary	—	—	—	12,300.00
Total Annual Emissions				401,671.00

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent

Estimated annual mitigated operational mobile source GHG emissions by air basin for Scenario A are presented in Table 4.7-13.

Table 4.7-13. Scenario A
Estimated Annual Mitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	244,833.17	7.44	0.00	245,019.34
MDAB	31,173.32	0.95	0.00	31,197.03
SCAB	74,255.55	2.26	0.00	74,312.02

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Emissions Comparison – Updated 28.7% HBW ICR Scenario and Scenario A

Table 4.7-14 presents a comparison of unmitigated and mitigated operational annual GHG emissions between the Updated 28.7% HBW ICR Scenario and Scenario A.

Table 4.7-14. Comparison of Updated 28.7% HBW ICR Scenario and Scenario A Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
Unmitigated	
Updated 28.7% HBW ICR Scenario	380,530.33
Scenario A	449,701.88
Net Change (Scenario A – Updated 28.7% HBW ICR Scenario)	69,171.55
Mitigated	
Updated 28.7% HBW ICR Scenario	338,589.01
Scenario A	401,671.00
Net Change (Scenario A – Updated 28.7% HBW ICR Scenario)	63,081.99

Source: Dudek 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent.

As shown in Table 4.7-14, Scenario A would result in greater GHG emissions compared to the Updated 28.7% HBW ICR scenario under unmitigated and mitigated conditions, with an increase in emissions between approximately 18 and 19 percent.

Scenario B

Scenario B assumes that the project will be entitled for the development of 12,000 dwelling units and 5.1 million square feet of nonresidential land uses with a 20 percent reduction in internalized trips. Scenario B involves the same land use breakdown as the Updated 28.7% HBW scenario, but with this different ICR assumption, which results in higher VMT and associated mobile source emissions. The land use inputs for Scenario B that were modeled in CalEEMod are shown in Table 2.6-11 of the 2019 Air Study. The Scenario B GHG emissions calculation methodology is described in Section 3.6.2.2 of the 2019 Air Study.

Estimated Unmitigated Emissions – Scenario B

Estimated annual unmitigated operational GHG emissions for Scenario B would be approximately 513,342 MT CO_2e, as shown in Table 4.7-15.

Table 4.7-15. Estimated Annual Unmitigated Operational Greenhouse Gas Emissions – Scenario B

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.31	0.24	0.10	5,378.68
Energy	44,183.14	2.31	0.75	44,465.63
Mobile	446,466.71	12.74	0.00	446,785.24
Solid Waste	1,197.97	70.80	0.00	2,967.9
Water Supply and Wastewater	1,435.04	0.11	0.02	1,444.71
Stationary	—	—	—	12,300.00
Total Annual Emissions				513,342.16

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual unmitigated operational mobile source GHG emissions by air basin for Scenario B are set forth in Table 4.7-16.

Table 4.7-16. Estimated Annual Unmitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario B

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	310,740.83	8.87	0.00	310,962.53
MDAB	40,137.36	1.15	0.00	40,165.99
SCAB	95,588.52	2.73	0.00	95,656.72

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Estimated Mitigated Emissions – Scenario B

As shown in Table 4.7-17, estimated annual mitigated operational GHG emissions for Scenario B would be approximately 459,698 MT CO_2e.

Table 4.7-17. Estimated Annual Mitigated Operational Greenhouse Gas Emissions – Scenario B

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.31	0.24	0.1	5,378.68
Energy	28,870.14	1.26	0.50	29,051.30
Mobile	408,256.72	11.94	0.00	408,555.16
Solid Waste	1,197.97	70.80	0.00	2,967.92
Water Supply and Wastewater	1,435.04	0.11	0.02	1,444.71
Stationary	—	—	—	12,300.00
Total Annual Emissions				459,697.77

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent

Estimated annual mitigated operational mobile source GHG emissions by air basin for Scenario B are set forth in Table 4.7-18.

Table 4.7-18. Estimated Annual Mitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario B

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	284,146.68	8.31	0.00	284,354.39
MDAB	36,702.28	1.07	0.00	36,729.11
SCAB	87,407.76	2.56	0.00	87,471.66

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Emissions Comparison – Updated 28.7% HBW ICR Scenario and Scenario B

Table 4.7-19 presents a comparison of unmitigated and mitigated operational annual GHG emissions between the Updated 28.7% HBW ICR Scenario and Scenario B.

Table 4.7-19. Comparison of Updated 28.7% HBW ICR Scenario and Scenario B Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
Unmitigated	
Updated 28.7% HBW ICR Scenario	380,530.33
Scenario B	513,342.00
Net Change (Scenario B – Updated 28.7% HBW ICR Scenario)	132,811.67
Mitigated	
Updated 28.7% HBW ICR Scenario	338,589.01
Scenario B	459,697.77
Net Change (Scenario B – Updated 28.7% HBW ICR Scenario)	121,108.76

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent.

As shown in Table 4.7-19, Scenario B would result in greater GHG emissions compared to the Updated 28.7% HBW ICR Scenario under unmitigated and mitigated conditions, with an increase in emissions between approximately 35 and 36 percent.

Scenario C

Scenario C assumes that the project will be entitled for the development of 9,000 dwelling units and 3.825 million square feet of nonresidential land uses with a 20 percent reduction in internalized trips. Scenario C involves less residential and nonresidential development than the Updated 28.7% HBW ICR Scenario, and this different ICR assumption, which results minimally greater mobile source emissions. The land use inputs for Scenario C that were modeled in CalEEMod are shown in Table 2.6-19 of the 2019 Air Study. The Scenario C GHG emissions calculation methodology is described in Section 3.6.3.2 of the 2019 Air Study.

Estimated Unmitigated Emissions – Scenario C

Estimated annual unmitigated operational GHG emissions for Scenario C would be approximately 385,007 MT CO_2e, as shown in Table 4.7-20.

Table 4.7-20. Estimated Annual Unmitigated Operational Greenhouse Gas Emissions – Scenario C

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	4,008.23	0.18	0.07	4,034.01
Energy	33,137.45	1.73	0.57	33,349.31
Mobile	334,850.64	9.56	0.00	335,089.53
Solid Waste	898.48	53.10	0.00	2,225.95
Water Supply and Wastewater	1,076.28	0.08	0.02	1,083.53
Stationary	—	—	—	9,225.00
Total Annual Emissions				385,007.33

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual unmitigated operational GHG emissions by air basin for Scenario C are set forth in Table 4.7-21.

Table 4.7-21. Estimated Annual Unmitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario C

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	233,056.05	6.65	0.00	233,222.31
MDAB	30,103.07	0.86	0.00	30,124.55
SCAB	71,691.52	2.05	0.00	71,742.67

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Estimated Mitigated Emissions – Scenario C

Estimated annual mitigated operational GHG emissions for Scenario C are set forth in Table 4.7-22, which are approximately 344,774 MT CO_2e.

Table 4.7-22. Estimated Annual Mitigated Operational Greenhouse Gas Emissions – Scenario C

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	4,008.23	0.18	0.07	4,034.01
Energy	21,652.66	0.94	0.38	21,788.53
Mobile	306,193.09	8.95	0.00	306,416.91
Solid Waste	898.48	53.10	0.00	2,225.95
Water Supply and Wastewater	1,076.28	0.08	0.02	1,083.53
Stationary	—	—	—	9,225.00
Total Annual Emissions				344,773.93

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual mitigated operational mobile source GHG emissions by air basin for Scenario C are presented in Table 4.7-23.

Table 4.7-23. Estimated Annual Mitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario C

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	213,110.39	6.23	0.00	213,266.17
MDAB	27,526.76	0.80	0.00	27,546.88
SCAB	65,555.94	1.92	0.00	65,603.86

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Emissions Comparison – Updated 28.7% HBW ICR Scenario and Scenario C

Table 4.7-24 presents a comparison of unmitigated and mitigated operational annual GHG emissions between the Updated 28.7% HBW ICR Scenario and Scenario C.

Table 4.7-24. Comparison of SRER and Scenario C Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
Unmitigated	
Updated 28.7% HBW ICR Scenario	380,530.33
Scenario C	385,007.21
Net Change (Scenario C – Updated 28.7% HBW ICR Scenario)	4,476.88
Mitigated	
Updated 28.7% HBW ICR Scenario	338,589.01
Scenario C	344,773.93
Net Change (Scenario C – Updated 28.7% HBW ICR Scenario)	6,184.92

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent.

As shown in Table 4.7-24, under unmitigated and mitigated conditions, Scenario C would result in minimally greater GHG emissions compared to the Updated 28.7% HBW ICR Scenario, with an increase between approximately 1 and 2 percent.

Scenario D

Scenario D assumes that the project will be entitled for the development of 14,000 dwelling units with no commercial development. The land use inputs for Scenario D that were modeled in CalEEMod are shown in Table 2.6-30 of the 2019 Air Study. The Scenario D GHG emissions calculation methodology is described in Section 3.6.4.2 of the 2019 Air Study.

Estimated Unmitigated Emissions – Scenario D

Estimated annual unmitigated operational GHG emissions for Scenario D would be approximately 451,320 MT CO_2e, as shown in Table 4.7-25.

Table 4.7-25. Estimated Annual Unmitigated Operational Greenhouse Gas Emissions – Scenario D				
Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	6,234.92	0.28	0.11	6,275.06
Energy	36,872.28	1.82	0.63	37,106.54
Mobile	383,192.74	10.42	0.00	383,453.34
Solid Waste	855.48	50.56	0.00	23,119.41
Water Supply and Wastewater	1,356.45	0.11	0.02	1,365.60
Stationary	—	—	—	0.00
Total Annual Emissions				451,319.95

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent;

Estimated annual unmitigated operational GHG emissions by air basin for Scenario D are set forth in Table 4.7-26.

Table 4.7-26. Estimated Annual Unmitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario D				
Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	265,131.06	7.21	0.00	265,311.37
MDAB	34,908.86	0.95	0.00	34,932.60
SCAB	83,152.82	2.26	0.00	83,209.37

Source: Dudek 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since CalEEMod does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Estimated Mitigated Emissions – Scenario D

Estimated annual mitigated operational GHG emissions for Scenario D are set forth in Table 4.7-27, which are approximately 387,844 MT CO2e.

Table 4.7-27. Estimated Annual Mitigated Operational Greenhouse Gas Emissions – Scenario D				
Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	6,234.92	0.28	0.11	6,275.06
Energy	24,879.30	1.01	0.44	25,034.43
Mobile	352,806.11	9.72	0.00	353,049.00
Solid Waste	855.48	50.56	0.00	2,119.41
Water Supply and Wastewater	1,356.45	0.11	0.02	1,365.60
Stationary	—	—	—	0.00
Total Annual Emissions				387,843.50

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual mitigated operational mobile source GHG emissions by air basin for Scenario D are presented in Table 4.7-28.

Table 4.7-28. Estimated Annual Mitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario D

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	244,106.55	6.73	0.00	244,274.60
MDAB	32,140.64	0.89	0.00	32,162.76
SCAB	76,558.93	2.11	0.00	76,611.63

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Emissions Comparison – Updated 28.7% HBW ICR Scenario and Scenario D

Table 4.7-29 presents a comparison of unmitigated and mitigated operational annual GHG emissions between the Updated 28.7% HBW ICR Scenario and Scenario D.

Table 4.7-29. Comparison of Updated 28.7% HBW ICR Scenario and Scenario D Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
Unmitigated	
Updated 28.7% HBW ICR Scenario	380,530.33
Scenario D	451,319.79
Net Change (Scenario D – Updated 28.7% HBW ICR Scenario)	70,789.46
Mitigated	
Updated 28.7% HBW ICR Scenario	338,589.01
Scenario D	387,843.50
Net Change (Scenario D – Updated 28.7% HBW ICR Scenario)	49,254.49

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent.

As shown in Table 4.7-29, under unmitigated and mitigated conditions, Scenario D would result in greater GHG emissions compared to the Updated 28.7% HBW ICR Scenario, with an increase between approximately 15 and 19 percent.

Scenario E

Scenario E assumes that the project will be entitled for the development of 12,000 dwelling units with no commercial development. The land use inputs for Scenario E that were modeled in CalEEMod are shown in Table 2.6-39 of the 2019 Air Study. The Scenario D GHG emissions calculation methodology is described in Section 3.6.5.2 of the 2019 Air Study.

Estimated Unmitigated Emissions – Scenario E

Estimated annual unmitigated operational GHG emissions for Scenario E would be approximately 374,296 MT CO_2e, as shown in Table 4.7-30.

Table 4.7-30. Estimated Annual Unmitigated Operational Greenhouse Gas Emissions – Scenario E				
Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.22	0.24	0.10	5,378.58
Energy	31,604.86	1.56	0.54	31,805.65
Mobile	328,451.07	8.93	0.00	328,674.44
Solid Waste	2,933.07	173.34	0.00	7,266.56
Water Supply and Wastewater	1,162.67	0.09	0.02	1,170.51
Stationary	—	—	—	0.00
Total Annual Emissions				374,295.74

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual unmitigated operational GHG emissions by air basin for Scenario E are set forth in Table 4.7-31.

Table 4.7-31. Estimated Annual Unmitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario E				
Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	227,255.30	6.18	0.00	227,409.85
MDAB	29,921.89	0.81	0.00	29,942.24
SCAB	71,273.88	1.94	0.00	71,322.35

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Estimated Mitigated Emissions – Scenario E

Estimated annual mitigated operational GHG emissions for Scenario E are set forth in Table 4.7-32, which are approximately 332,437 MT CO_2e.

Table 4.7-32. Estimated Annual Mitigated Operational Greenhouse Gas Emissions – Scenario E				
Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	5,344.22	0.24	0.1	5,378.58
Energy	21,325.13	0.87	0.37	21,458.11
Mobile	302,405.37	8.33	0.00	302,613.56
Solid Waste	733.27	43.33	0.00	1,816.64
Water Supply and Wastewater	1,162.67	0.09	0.02	1,170.51
Stationary	—	—	—	0.00
Total Annual Emissions				332,437.40

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.

Estimated annual mitigated operational mobile source GHG emissions by air basin for Scenario E are presented in Table 4.7-33.

Table 4.7-33. Estimated Annual Mitigated Operational Mobile Source Greenhouse Gas Emissions by Air Basin – Scenario E

Mobile Source Location	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
SJVAB	209,234.28	5.76	0.00	209,378.32
MDAB	27,549.13	0.76	0.00	27,568.10
SCAB	65,621.97	1.81	0.00	65,667.14

Source: Dudek, 2019a, Appendix D.
Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; SJVAB = San Joaquin Valley Air Basin; MDAB = Mojave Desert Air Basin; SCAB = South Coast Air Basin.
Full buildout in year 2036 assumed. Operational Year 2035 was conservatively used for anticipated Operational Year 2036 since California Emissions Estimator Model (CalEEMod) does not include year 2036.
All scenarios assume the project-specific vehicle fleet mix and default CalEEMod vehicle emission factors for the Kern County portion of the SJVAB.

Emissions Comparison – Updated 28.7% HBW ICR Scenario and Scenario E

Table 4.7-34 presents a comparison of unmitigated and mitigated operational annual GHG emissions between the Updated 28.7% HBW ICR Scenario and Scenario E.

Table 4.7-34. Comparison of Updated 28.7% HBW ICR Scenario and Scenario E Estimated Annual Unmitigated and Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
Unmitigated	
Updated 28.7% HBW ICR Scenario	380,530.33
Scenario E	374,295.60
Net Change (Scenario E – Updated 28.7% HBW ICR Scenario)	(6,234.73)
Mitigated	
Updated 28.7% HBW ICR Scenario	338,589.01
Scenario E	332,437.40
Net Change (Scenario E – Updated 28.7% HBW ICR Scenario)	(6,151.61)

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent.
Numbers in parenthesis represent a negative number.

As shown in Table 4.7-34, under unmitigated and mitigated conditions, Scenario E would result in minimally lower GHG emissions compared to the Updated 28.7% HBW ICR Scenario, with a decrease in emissions of approximately 2 percent.

Conclusion

Table 4.7-35 sets forth a comparison of the estimated annual unmitigated operational GHG emissions for the 2016 EIR, Updated 28.7% HBW ICR Scenario, and all analyzed scenarios (i.e., Scenarios A, B, C, D, E). While the 2016 EIR presents an apple-to-oranges comparison, it is provided for disclosure purposes and ease of reference.

Table 4.7-35. Comparison of Scenarios
Estimated Annual Unmitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
2016 EIR	579,994.38
Updated 28.7% HBW ICR Scenario	379,085.78
Scenario A	449,702.04
Scenario B	513,342.16
Scenario C	385,007.33
Scenario D	451,319.95
Scenario E	374,295.74

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent; 2016 EIR = Draft Environmental Impact Report.

Table 4.7-36 sets forth a comparison of the estimated annual mitigated operational GHG emissions for the 2016 EIR, Updated 28.7% HBW ICR Scenario, and all analyzed scenarios (i.e., Scenarios A, B, C, D, and E). While the 2016 EIR presents an apple-to-oranges comparison, it is provided for disclosure purposes and ease of reference.

Table 4.7-36. Comparison of Scenarios
Estimated Annual Mitigated Operational Greenhouse Gas Emissions

Scenario	CO_2e (Metric Tons Per Year)
2016 EIR	565,624.14
Updated 28.7% HBW ICR Scenario	338,589.01
Scenario A	401,671.00
Scenario B	459,697.77
Scenario C	344,773.93
Scenario D	387,843.50
Scenario E	332,437.40

Source: Dudek, 2019a, Appendix D.
Notes: CO_2e = carbon dioxide equivalent; 2016 EIR = Draft Environmental Impact Report.

As shown in Table 4.7-36, with implementation of all feasible mitigation measures:

- Scenario A would generate greater GHG emissions than estimated for the Updated 28.7% HBW ICR Scenario, but less than estimated for the 2016 EIR;
- Scenario B would generate greater GHG emissions than estimated for the Updated 28.7% HBW ICR Scenario, but less than estimated for the 2016 EIR;
- Scenario C would generate greater GHG emissions than estimated for the Updated 28.7% HBW ICR Scenario, but less than estimated for the 2016 EIR;
- Scenario D would generate greater GHG emissions than estimated for the Updated 28.7% HBW ICR Scenario, but less than estimated for the 2016 EIR; and
- Scenario E would generate less GHG emissions than estimated for both the Updated 28.7% HBW ICR Scenario and 2016 EIR.

Like the Updated 28.7% HBW ICR Scenario, all of the Reduced ICR Scenarios analyzed in this section would comply and be consistent with an extensive list of applicable regulatory programs designed to reduce GHG emissions and will thus contribute to the achievement of California's and AB 32's GHG reduction goals. Most importantly, for purposes of this analysis, each higher VMT

scenario would comply and be consistent with the Cap-and-Trade Program. As shown in Table 4.7-7, because emissions from major GHG-emitting sources, such as electricity generation, fuel distributors (e.g., natural gas and transportation fuels), and large stationary sources are capped under the Cap-and-Trade Program, almost all of the GHG sources associated with each scenario would be subject to the cap-and-trade regulations.

In accordance with SJVAPCD Policy APR-2015 and consistent with *Association of Irritated Residents v. Kern County Board of Supervisors, et al.* (2017) 17 Cal.App.5th 708, the GHG impacts associated with each of the Reduced ICR Scenarios could be considered less than significant and therefore not cumulatively considerable. However, many measures incorporated in the higher VMT scenario analysis are regional or statewide in nature and do not provide a mechanism that guarantees GHG emission reductions on a cumulative basis. In addition, Kern County does not have the jurisdictional authority to control the various cumulative sources of GHGs in the County, or the GHG emissions from sources around the globe, which all contribute to climate change. Although many other agencies with the necessary jurisdiction are currently taking action to reduce GHG emissions, the County cannot assure that these measures would ultimately be implemented or sufficient to address climate change. Therefore, the Updated 28.7% HBW ICR Scenario, and each of the Reduced ICR Scenarios, have the potential to generate GHG emissions, either directly or indirectly, that may have cumulatively considerable significant impact on the environment, even with implementation of the feasible mitigation measures described in Section 4.7.4.4., and this cumulative impact is considered significant and unavoidable.

Mitigation Measures

MM 4.7-1 **Comply with Applicable Regulations and Rules.** The project would be required to comply with all applicable state and San Joaquin Valley Air Pollution Control District (SJVAPCD) Rules and Regulations including, but not limited to:

1. Quantified GHG Reductions (Evaluated in CalEEMod):
    a) Pavley Motor Vehicle Standards (AB 1493)
    b) Low Carbon Fuel Standard (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 7, Section 95480 et seq.)
    c) Title 24 (part 6 [Energy Code] and part 11 [CALGreen Code]) of the California Code of Regulations
    d) Renewable Portfolio Standard (SB X1 2 and SB 350)
    e) Wood Burning Fireplaces and Wood Burning Heaters (SJVAPCD Rule 4901)
    f) Solid Waste Diversion (AB 341) and statewide reduction in potable urban water usage of 25 percent relative to water use in 2013 (Executive Order B-29-15)
    g) Model Water Efficient Landscape Ordinance (MWELO) (California Code of Regulations, Title 23, Division 2, Chapter 2.7)

h) Kern County Code of Ordinances – Landscaping Requirements and Water Efficient Landscaping (Kern County Code of Ordinances, Title 19, Chapter 19.86, Sections 19.86.050 and 19.86.060)

i) California Water Code (Division 6, Part 2.10, Sections 10910–10915)

2. Additional GHG Reductions

a) EPA and NHTSA GHG and CAFE standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles (75 FR 25324–25728 and 77 FR 62624–63200) and for medium- and heavy-duty vehicles (76 FR 57106–57513)

b) Cap-and-Trade Program for Electricity, Stationary Sources, and Fuels (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 5, Section 95801 et seq.)

c) Advanced Clean Cars Program (California Code of Regulations, Title 13, Division 3, Chapter 1, Articles 1, 2, 6 (parts); Chapter 2, Articles 1, 2.1, 2.3, 2.4 (parts); Chapter 4.4 (parts); Chapter 8 (parts).

d) Under Inflated Vehicle Tires (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 8, Section 95550 et seq.)

e) Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Regulation (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 1, Section 95300 et seq.)

f) Management of High Global Warming Potential Refrigerants for Stationary Sources (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5.1, Section 95380 et seq.)

g) Small Containers of Automotive Refrigerant (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5, Section 95360 et seq.)

h) High-Global Warming Potential Greenhouse Gases in Consumer Products (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 8.5, Article 2)

i) CALGreen Code as Adopted by the Building Standards Commission (California Code of Regulations, Title 24, Part 11 Emergency Building Standard DSA-SS EF-02/15)

j) California Lighting Efficiency and Toxics Reduction Act (AB 1109 of 2007, Stats. 2007, ch. 534) and implementing regulations.

(California Code of Regulations, Title 20, Division 2, Chapter 4, Article 4)

k) Executive Order B-29-15 (April 1, 2015) (SWRCB mandatory water reductions)

l) CARB In-Use Off-Road Diesel Vehicle Regulation (California Code of Regulations, Title 13, Division 3, Chapter 9, Article 4.8)

m) CARB In-Use On-Road Heavy-Duty Diesel Vehicles Regulation (Truck and Bus Regulation) (California Code of Regulations, Title 13, Division 3, Chapter 1, Article 4.5)

n) CARB Landfill Methane Control Measure (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 6)

o) Mandatory Commercial Recycling (AB 341 of 2011, Statutes of 2011, Ch. 476)

p) Million Solar Roofs Program (Senate Bill 1 of 2006, Statutes of 2006, Chapter 132)

q) California Solar Initiative- Thermal Program (California Public Utilities Commission Decision 10-01-022, January 21, 2010)

r) Waste Heat and Carbon Emissions Reduction Act (Statutes of 2007, Chapter 713; Statutes of 2008, Chapter 253)

s) Emergency State Water Board Regulations (California Code of Regulations, Title 23, Division 3, Chapter 2, Article 22.5)

t) Executive Order B-37-16 (May 9, 2016) (water conservation regulations)

u) Water Conservation Act of 2009 (Senate Bill X7-7, Statutes of 2009, Chapter 4)

v) Water Reclamation Requirements for Recycled Water Use (SWRCB Order WQ 2016-0068-DDW)

w) Regulations for Groundwater Replenishment Using Recycled Water (California Code or Regulations, Title 22, Division 4, Chapter 3)

x) Policy for Water Quality Control for Recycled Water (SWRCB Resolution No. 2009-0011, as amended by Resolution No. 2013-0003)

MM 4.7-2 **Greenhouse Gas Emissions Reduction Measures**. Prior to approval of any final tentative tract map or commercial/industrial site development plan, or at building permit as appropriate and acceptable to Kern County, the project proponent shall provide evidence to the Kern County Planning and Natural Resources Department that the following menu of greenhouse gas emissions reduction measures are being implemented in conformance with the Grapevine Specific and Community Plan. Building design standards shall be made conditions of approval of any commercial/ industrial site plan or included as notes on any final recorded tentative tract map.

1. Require service fleet vehicles to be powered with alternative fuel technology where feasible, as determined by the individual project applicants.
2. Designate at least two locations with adequate pedestrian, bicycle, and parking facilities for off-site transit connection service.
3. Provide multiple travel options for residents, workers, and visitors through a comprehensive multi-modal network including, but not limited to, transit, paths, trails, and connections integrated into the overall circulation network.

4. Ensure that higher density residential, commercial and offices and other high-demand uses are located near, and provide connection through Transit Management Association measures to, transit hubs.
5. Locate two transit hubs in the village centers on both sides of Interstate 5 (I-5) that would be accessible by local and regional transit routes and community multi-modal paths and trails.
6. Establish a Transit Management Association to promote, manage, and monitor transit and mobility services and infrastructure, as further described in Section 4.16, Transportation and Traffic.
7. Promote alternative fuels for transit system, if available.
8. Encourage use of best feasible alternative fuel technology to be used in homeowner's association, refuse fleet, and other community service vehicles.
9. Provide a framework for a community-wide parking plan that is based on parking demand and need.
10. Provide preferential parking for carpool, shared, electric, and hydrogen vehicles.
11. Require builders to install broadband infrastructure or other communication technologies that encourage telecommuting and working from home.
12. Integrate traffic calming measures into the community-wide circulation network to promote reduced speeds and encourage pedestrian and bicycle trips.
13. Provide sidewalks and crosswalks at all streets (along with general pedestrian connectivity throughout project) to encourage pedestrian traffic and offer an alternative to vehicle trips.
14. Construct a multi-purpose internal trail system that includes off-road bikeways within the street right-of-way (paseos) and within a greenway system.
15. Incorporate natural gas or propane hookups, electrical outlets on patios, and prohibit wood-burning fireplaces.
16. Equip a minimum of 70 percent of public and community pools and spas with active solar water heating systems where heating is necessary or desired.
17. Provide all single-family homebuyers with the option to include a photovoltaic array system as a home design feature.
18. Implement energy-efficient design practices such as high-performance glazing, Energy Star compliant systems and appliances, radiant heat roof barriers (including but not limited to high-albedo white thermoplastic polyolefin roof membrane), high efficient HVAC with hot-gas reheat, insulation on all pipes, programmable thermostats, solar access, shading of HVAC systems from direct sunlight, use of formaldehyde-free insulation, use of recycled-content gypsum board, sealed ducts, orientation of building and incorporation of landscaping to maximize passive solar (heating during cool

seasons, and minimize heat gain during hot season), and designs that take advantage of prevailing winds.

19. Prohibit use of chlorofluorocarbon refrigerants in commercial buildings.
20. Ensure recycling of construction debris and waste through administration by an on-site recycling coordinator and presence of recycling/separation area, as described in Section 4.14, Public Services, and by maintaining on the Grapevine Community website information about recycling, and the availability of and potential uses for recycled materials, such as the use of salvaged and recycled content materials for hard surface and non-plant landscaping materials.
21. Establish and operate a community waste recycling program including education and outreach, recycled waste pickup and drop-off services, as described in Section 4.14, Public Services.
22. Implement a water wise program that includes all feasible measures to reduce indoor water use and associated energy use (e.g., for interior fixtures, require tankless water heaters and low-flow plumbing and fixtures), as described in Section 4.17, Utilities and Service Systems.
23. Implement landscape standards that include irrigation standards to maximize efficiency and decrease water use and waste. Prepare and distribute landscape design guidelines to minimize the use of exterior water by requiring each homeowner to select from landscape materials that are within the Maximum Applied Water Allowance budget that will be assigned to each lot or home, as described in Section 4.17, Utilities and Service Systems.
24. Use recycled water from on-site wastewater treatment plant(s) as a permanent source of water for landscaped common areas and other authorized uses, as described in Section 4.17, Utilities and Service Systems.
25. Use recycled water for irrigation of 50 percent of commercial landscape areas, as described in Section 4.17, Utilities and Service Systems.
26. Use native species and drought tolerant species for a minimum of 75 percent of the ornamental plant palette in non-turf areas for all commercial, industrial, common and public areas, and residential front-yard landscaping to minimize water demand, as described in Section 4.17, Utilities and Service Systems.
27. Minimize turf areas and encourage alternative ground covers (20 percent maximum turf in landscaped commercial areas and 45 percent maximum turf in residential front yard landscaping), as described in Section 4.17, Utilities and Service Systems.
28. Design irrigation systems to conform to the hydrozones of the landscape design plan and optimize water efficiency by matching plant type, utilizing drip or subsurface irrigation wherever possible, and applying water at agronomic rates, as described in Section 4.17, Utilities and Service Systems.
29. Require “smart” controllers, such as weather-based irrigation controllers or other self-adjusting irrigation controllers, for all irrigation systems that will

accommodate all aspects of the landscape and irrigation design plans, as described in Section 4.17, Utilities and Service Systems.

30. Include in street design proposals for County review technically feasible (given expected future uses) and legally feasible (given applicable ordinances and other requirements) street designs that include permeable pavement, groundcovers, or other measures to reduce use of concrete and asphalt.
31. Require garages in single family homes to be wired with a 240 kV outlet, suitable for future electric car charging devices or service.
32. Require non-residential uses to have at least one electric vehicle charging station for every 50,000 square feet of gross-leasable areas.
33. Require one electric vehicle charging station for every 15 dwelling units.
34. The TMA shall work with automotive dealers to help promote compressed natural gas (CNG), electric, and hybrid electric vehicles.
35. Incorporate electric truck charging capabilities in loading docks by installing a 240 kV outlet in the vicinity of the loading dock.
36. The project proponent shall maintain a Grapevine Community website that includes, but is not limited to, information about greenhouse gas (GHG) reduction opportunities to help educate project residents, as well as schools, other agencies, and businesses with facilities on the project site.
37. Include on the Grapevine Community website information about rebates and low-interest loans to residents that make energy-saving improvements to their homes.
38. Site and design building to take advantage of daylight where feasible and consistent with building purpose.
39. Use trees, landscaping and sunscreens to west and south exterior building walls to reduce energy use where feasible and consistent with building and site purpose, and consistent with other applicable requirements such as encouraging higher density and restricted plant palette.
40. Install cool pavements if approved by Caltrans and County Roads to roadway uses, provided that road installation and maintenance durability and costs are comparable to existing approved roadway materials (since early replacements or more intensive repair result in higher GHG emissions.
41. Require use of removal covers for pools and spas. (“Automatic” covers may result in accidental drownings or other injuries; efficient pumps and motors for pools and spas are already required under applicable Building Energy Efficiency Standards (Cal. Code Regs., Title 24, Part 6 §§ 110.3, 110.4, 110.5) and Title 20 Standards (Cal. Code Regs., Title 20 §§ 1605.1(g), 1605.3(g)).
42. Require use of CARB-approved or electric landscape maintenance equipment for public common areas.

43. Include on the Grapevine Community website information about the air quality and greenhouse gas benefits of electric landscape maintenance equipment.
44. Limit the hours of community-managed lighting on public streets to midnight unless later lighting will advance public safety and walkability goals.
45. Educational information on energy and water conservation and efficiency for project residents, customers, tenants and large energy users shall be maintained on the Grapevine community website.
46. Include in Grapevine Community website information about energy conservation and financial incentive programs, and about potential energy technology systems that may be suitable for larger commercial and institutional users such as combined heat and power systems.
47. All single family homes are required to be wired for a 240 kv line to accommodate electric vehicle charging uses and devices.

MM 4.7-3 **Greenhouse Gas Emissions Reduction Reporting on Compliance with 29 Percent Reduction Threshold**. Prior to the issuance of building permits, a focused greenhouse gas report shall be submitted that identifies the measures (regulatory or project-proponent-implemented, in all sectors relevant to project GHG emissions, including but not limited to cleaner fuels and more efficient cars and trucks, cleaner energy from the grid, more energy-efficient buildings materials and standards used onsite, emission offsets, project-proponent-funded offsite energy conservation improvements to existing homes and structures, etc.) to confirm that the project is reducing by 29 percent in relation to business as usual (2008) its carbon dioxide (CO_2) equivalent emissions as quantified in the Environmental Impact Report consistent with the San Joaquin Valley Air Pollution Control District Greenhouse Gas Guidance (SJVAPCD, 2009), as applied to the final number of houses or square footage and type of commercial/industrial constructed for each site. The focused greenhouse gas report shall be submitted to the San Joaquin Valley Air Pollution Control District for review and comment regarding the methodology used to quantify greenhouse gas reductions. The report can be for an individual house, multiple structures, or for a phase of a tract or commercial/industrial site plan.

MM 4.7-4: Energy Conservation. Prior to approval of any tentative tract map (excluding financing maps) approval or commercial site development plan, the project proponent shall provide the Kern County Planning and Natural Resources Department with an Energy Plan documenting compliance with all applicable energy conservation requirements of applicable Title 24 standards in the California Code of Regulations, including but not limited to, the 2019 Title 24 standards (effective as of January 1, 2020).

The Energy Plan shall also confirm that a menu of energy efficiency design elements, along with other design considerations and options, has been made available by the project proponent to builders, developers, and property owners as part of the internal design review process. Each developer, builder, or property owner shall incorporate the design elements required to comply with then-

applicable Title 24 requirements, and select from the menu or implement other available technologies as may be needed to reduce energy consumption 15% below 2016 Title 24 requirements.

All provisions outlined in the approved Energy Plan shall be either conditions of approval for any commercial/industrial site plan or included as notes on all final subdivision maps.

All provisions outlined in the approved Energy Plan shall be either conditions of approval for any commercial/industrial site plan or included as notes on all final subdivision maps.

MM-4.7-5 **Exterior Lighting Plan.** An Exterior Lighting Plan shall be prepared by an electrical engineer who is registered in the State of California, and approved by the County prior to the submittal of each building permit. The Lighting Plan shall apply to all proposed structures and for development areas that border natural open space resources.

The Lighting Plan shall be consistent with the County's Outdoor Lighting Dark Skies Ordinance (Chapter 19.81 of the Zoning Code) and shall provide guidelines for the outdoor lighting to be used throughout the project site. Final lighting orientation and design shall be approved by the County. The Lighting Plan shall include, but not be limited to, the following:

a. All lighting within 300 feet of natural open space areas shall only be implemented where needed for safety and shall be directed away from these areas and shielded so that light is not directed into open space or riparian areas. Where possible, these safety lights shall be motion sensor activated with infrared light sensors to prevent daytime lighting.

b. Mercury vapor and halide lighting shall not be used on the perimeter of the developed areas or adjacent to designated open space.

c. Illumination levels should be compatible with the character and use of surrounding development as determined by national lighting organizations. The Illuminating Engineering Society of North America publishes recommendations for the lighting industry that include illumination levels for outdoor lighting.

d. Low-pressure sodium lighting fixtures or flashing lights shall not be used except in emergency situations.

e. Exterior lighting standards and fixtures shall be located and designed to minimize direct glare beyond the site boundaries. Lighting shall be fully shielded and directed downwards to confine light spread solely within necessary locations. Illumination or glare from the exterior lighting system onto adjacent properties or streets should be minimized.

f. Security lighting fixtures shall not project above the roof line of the building on which they are mounted.

g. Where applicable, time-control devices shall be utilized on exterior lighting sources.

h. Street, parking lot, and structural lighting fixtures shall provide adequate illumination for safety and comfort of vehicular and pedestrian traffic while minimizing light spillover.

MM-4.7-6 On-Site Renewable Energy. Applications for a tentative tract map, parcel map (except financing map), or commercial site plan review shall include plans and analysis to demonstrate 50% of the project's anticipated electrical energy demand at buildout shall be satisfied from on-site renewable energy generation. Subsequent building permit applications shall include plans identifying renewable energy source and specifications, or location of renewable source if not located on a specific building pad for which a building permit is being sought. "Anticipated electrical energy demand" shall be determined on the basis of the anticipated loads for each building as shown in the reports submitted at the time of building permit application pursuant to the Building Energy Efficiency Standards of Title 24. "On-site renewable energy generation" includes, but is not limited to, solar, wind, geothermal, biofuel, and hydroelectric systems. These systems shall be installed in connection with the development of one or more of the following: residential units, nonresidential buildings, public buildings, or Specific Plan utility facilities located within the Specific Plan area.

The project shall also be designed to include rooftop solar generation that is the more stringent of a) compliance with Calgreen solar rooftop compliance mandate and b) provide renewable energy production for energy savings that is equivalent to electrical generation resulting from installation of one photovoltaic (i.e., solar) power system no smaller than a 2-kw solar panel for every single-family dwelling unit and for every 1600 square feet of non-residential roof area. Through consultation and approval from the Planning and Natural Resources Director, to the extent allowed by applicable state laws, including Calgreen, the above provisions could be modified in such a manner that equivalent community energy savings to residence are provided through alternative solar facility or facilities rather than individual panel installation on each residential and non-residential unit

MM-4.7-7 Energy Efficient Appliances. Energy efficient major appliances and heating, ventilation, and air conditioning (HVAC) systems that meet the more stringent of applicable California Energy Commission (CEC) requirements or ENERGY STAR requirements, or equivalent, shall be offered by residential builders. Major appliances subject to this requirement include dishwashers, clothes washers, refrigerators, fans, and room air conditioners.

The following additional mitigation measures identified in Section 4.3, Air Quality, would also reduce mobile-source GHG emissions:

- MM-4.3-9 Internet Infrastructure and Telecommuting
- MM-4.3-10 Mobility Plan
- MM-4.3-11 Transportation Demand Management (TDM)
- MM-4.3-12 Locker/Shower Facilities

- MM-4.3-13 Preferential Parking and Electric Vehicle Charging for Nonresidential Buildings
- MM-4.3-14 Multi-Family Residential and Park/Trail Parking
- MM-4.3-15 Residential Parking
- MM-4.3-16 Electric Vehicle Charging and Incentive
- MM-4.3-17 Electric Vehicles

Level of Significance After Mitigation

Impacts would be significant and unavoidable.

Impact 4.7-2: Conflict with an Applicable Plan, Policy or Regulation Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases

This SREIR GHG emissions analysis does not address this threshold because it is not relevant to the updated emissions estimates. As stated in the FEIR (2016), the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and no mitigation is required. This impact would be less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance

Impacts would be less than significant.

Cumulative Setting Impacts and Mitigation Measures

Cumulative Setting

Under AB 32, the CARB, which is the agency in charge of regulating sources of emissions of GHGs in California, has been tasked with adopting regulations for reduction of GHG emissions. The effects of this project are evaluated based not upon the quantity of emissions, but rather on whether the project implements reduction strategies identified in AB 32, the Governor's Executive Order S-3-05, or other strategies to help toward reducing GHGs to the level proposed by the governor. If so, it could reasonably follow that the project would not result in a significant contribution to the cumulative impact of global climate change.

Impact 4.7-3: Cumulative Greenhouse Gas Emissions Impacts

Global climate change is a cumulative impact, and there are currently no established thresholds for assessing whether the GHG emissions of a project would be considered a cumulatively considerable contribution to global climate change. While the project would not result in a 29 percent reduction from BAU, this comparison was included for informational purposes since many sources of GHGs associated with the project would be subject to the cap-and-trade regulation and other state-implemented regulations that indirectly affect the project's emissions. However, many measures incorporated in the analysis are regional or statewide in nature and do not provide a mechanism that guarantees GHG emission reductions on a cumulative basis. In addition, Kern County does not

have the jurisdictional authority to control the various cumulative sources of GHGs in the County, or the GHG emissions from sources around the globe, which all contribute to climate change. Although many other agencies with the necessary jurisdiction are currently taking action to reduce GHG emissions, the County cannot assure that these measures would ultimately be implemented or sufficient to address climate change. Under each of the Reduced ICR Scenarios analyzed in the SREIR the project's GHG emissions would continue to be considered cumulatively considerable.

Mitigation Measures

Implement Mitigation Measures MM 4.7-1 through MM 4.7-7, as described above.

Level of Significance

Cumulative GHG emissions would be considered significant and unavoidable.