This section provides a discussion on the proposed White Knob/White Ridge Limestone Quarries Expansion Project and whether any element of the project would result in increased generation of greenhouse gas (GHG) emissions that could be considered cumulatively considerable. The discussion and conclusions in this section are based on an independent review of project-specific GHG emissions analysis and findings that have been developed by the applicant's air quality and GHG emissions consultant, Sespe Consulting, Inc. (*Air Quality and Greenhouse Gas Impact Assessment, Omya White Knob and White Ridge Quarries Expansion*, **EIR Appendix C**).

The County published a Notice of Preparation and Initial Study (NOP/IS) for the proposed project on June 12, 2013. A copy of the NOP/IS, along with comments received during the public review period, is contained in **EIR Appendix A**. There were no comments regarding greenhouse gas emissions/climate change.

3.6.1 ENVIRONMENTAL SETTING

EXISTING CLIMATE SETTING

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF_3), and sulfur hexafluoride (SF_6).

For most nonindustrial development projects, motor vehicles make up the bulk of GHG emissions produced on an operational basis. The primary greenhouse gases emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (CARB 2010). Following are descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

Carbon Dioxide

Carbon dioxide (CO_2) is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere (EPA 2008).

Methane

Methane (CH_4) is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. It is also formed and

released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (EPA 2011b).

Nitrous Oxide

Nitrous oxide (N_2O) is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years (EPA 2010a).

Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, which has an atmospheric life of 14 years) (EPA 2010a).

Perfluorocarbons

Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), perfluorohexane (C_6F1_4). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for CF_4 and C_2F_6 are 50,000 and 10,000 years, respectively (EFCTC 2003).

Nitrogen Trifluoride

Nitrogen trifluoride (NF_3) is an inorganic, colorless, odorless, toxic, non-flammable gas used as an etchant (etching medium) in micro-electronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition (PECVD) chambers in the production of liquid crystal displays and silicon-based thin film solar cells. It has a global warming potential of17,200 CO_2e. While NF_3 may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF_3 was listed by California as a high global warming potential GHG to be listed and regulated under Assembly Bill (AB) 32 (Section 38505 Health and Safety Code)).

Sulfur Hexafluoride

Sulfur hexafluoride (SF_6) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years (EPA 2008).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global warming potential, such as HFCs, PFCs, NT_3, and SF_6, are the most heat-absorbent. Methane traps over 21 times more heat per molecule than CO_2, and N_2O absorbs 310 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. **Table 3.6-1** shows the GWPs for different GHGs for a 100-year time horizon.

TABLE 3.6-1
GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES
(100-YEAR GIVEN TIME HORIZON)

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Dioxide (N_2O)	310
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)	6,500
Nitrogen Trifluouride (NF_3)	17,200
Sulfur Hexafluoride (SF_6)	23,900

Sources: California Climate Action Registry 2009.

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is the twelfth to sixteenth largest emitter of CO_2 in the world and produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (CEC 2006). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (CEC 2006). This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (CEC 2006).

EFFECTS OF GLOBAL CLIMATE CHANGE

With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea-level rise, and ecological shifts.

Many scientists believe that these changes are accelerating—locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California is

anticipated to face intensifying climate changes in coming decades (CNRA 2009). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures, and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009).

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4°F (an increase one to three times as large as that which occurred over the entire twentieth century).
- By 2100, the models project temperature increases between 3.6 to 9°F.

Precipitation levels are expected to change over the twenty-first century, though models differ in determining where and how much rain and snowfall patterns will change (CNRA 2009). Eleven out of 12 precipitation models run by the Scripps Institution of Oceanography suggest a small to significant (12–35 percent) overall decrease in precipitation levels by mid-century (CNRA 2009). In addition, higher temperatures hasten snowmelt and increase evaporation and make for a generally drier climate. Moreover, the 2009 California Climate Adaptation Strategy concludes that more precipitation will fall as rain rather than as snow, with important implications for water management in the state. California communities have largely depended on runoff from yearly established snowpack to provide the water supplies during the warmer, drier months of late spring, summer, and early autumn. With rainfall and meltwater running off earlier in the year, the state will face increasing challenges of storing the water for the dry season while protecting Californians downstream from floodwaters during the wet season.

There may be dramatic changes in average temperature and precipitation. In the next few decades, it is likely that the state will face a growing number of climate change–related extreme events such as heat waves, wildfires, droughts, and floods. Because communities, infrastructure, and other assets are at risk, such events can cause significant damages and are already responsible for a large fraction of near-term climate-related impacts every year (CNRA 2009).

Most climate projections developed to date produce gradual changes for a given climate variable. In the past, rapid climate changes have been observed, and scientists are increasingly concerned about additional abrupt changes that could push natural systems past thresholds beyond which they could not recover. Such events have been recorded in paleoclimatological records, but current global climate models cannot predict when they may occur again (CNRA 2009). Such abrupt changes have been shown to occur over very short periods of time (a few years to decades) and thus represent the most challenging situations to which society and

ecosystems would need to adapt (CNRA 2009). Short of being able to predict such abrupt changes, scientists are focusing their attention on aspects of the climate and earth system called "tipping elements" that can rapidly bring about abrupt changes.

Tipping elements refer to thresholds where increases in temperature cause a chain reaction of mutually reinforcing physical processes in the earth's dynamic cycles. The most dangerous of these include the following (CNRA 2009):

- A reduction in Arctic sea ice, which allows the (darker) polar oceans to absorb more sunlight, thereby increasing regional warming, accelerating sea ice melting even further, and enhancing Arctic warming over neighboring (currently frozen) land areas.

- The release of methane (a potent GHG), which is currently trapped in frozen ground (permafrost) in the Arctic tundra, will increase with regional warming and melting of the ground, leading to further and more rapid warming and resulting in increased permafrost melting.

- Continued warming in the Amazon could cause significant rainfall loss and large-scale dying of forest vegetation, which will further release CO2.

- The accelerated melting of Greenland and West Antarctic Ice Sheets observed in recent times, together with regional warming over land and in the oceans, involves mechanisms that can reinforce the loss of ice and increase the rate of global sea-level rise.

According to the 2009 California Climate Adaptation Strategy, the impacts of global warming in California have the potential to include, but are not limited to, the areas discussed in **Table 3.6-2**.

TABLE 3.6-2
POTENTIAL STATEWIDE IMPACTS FROM CLIMATE CHANGE

Potential Statewide Impact	Description
Public Health	Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves.
Floods and Droughts	The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease. Additionally, impacts can range from a loss of personal belongings, and the emotional ramifications from such loss, to direct injury and/or mortality. Drinking water contamination outbreaks in the United States are associated with extreme precipitation events. Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness. Floodwaters may contain household, industrial, and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water

Potential Statewide Impact	Description
	supplies. Flooding may also overload storm and wastewater systems, or flood septic systems, also leading to possible contamination of drinking water systems. Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both agricultural and commercial fisheries), and risks of waterborne illness. As surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence. Communities that utilize well water will be adversely affected by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies.
Water Resources	The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century—especially increases in hydrologic variability—will likely intensify in this century. The state can expect to experience more frequent and larger floods and deeper droughts. Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies. Planning for and adapting to these simultaneous changes, particularly their impacts on public safety and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century.
Forests and Landscapes	Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state.

Source: CNRA 2009

3.6.2 REGULATORY FRAMEWORK

FEDERAL

Federal Regulation and the Clean Air Act

In the past, the U.S. Environmental Protection Agency (EPA) has not regulated GHGs under the Clean Air Act because it asserted that the act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the U.S. Supreme Court held that the EPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, twelve states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007)). The court ruled that greenhouse gases fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. In 2009, the EPA responded to this ruling and made an endangerment finding that GHGs pose a threat to the public health and welfare. That was the first step necessary for the establishment of federal GHG regulations under the Clean Air Act.

In April 2010, the EPA issued the final rule on new standards for GHG emissions and fuel economy for light-duty vehicles in model years 2017–2025. In November 2010, the EPA published the "PSD [Prevention of Significant Deterioration] and Title V Permitting Guidance for Greenhouse Gases," which provides the basic information that permit writers and applicants need to address GHG emissions regulated under the Clean Air Act. In that document, the EPA described the "Tailoring Rule" in the regulation of GHG emissions. With the Tailoring Rule, the EPA established a phased schedule in the regulation of stationary sources. The first phase of the "Tailoring Rule" began January 2, 2011, and focuses the GHG permitting programs on the largest sources, greater than 75,000 tons of CO_2e per year, already subject to the Clean Air Act permitting based on their non-GHG regulated air pollutants. Then, in step two beginning June 1, 2011, the rule expanded to cover large sources of GHGs that may not have been previously covered by the Clean Air Act for other pollutants, with new sources with the potential to emit 100,000 tons of CO_2e per year or existing sources that undertake modifications that increase emissions by at least 75,000 tons of CO_2e per year. The rule also describes the EPA's commitment to future rulemaking that will describe subsequent steps of the Tailoring Rule for GHG permitting (EPA 2010b).

FEDERAL HEAVY-DUTY NATIONAL PROGRAM

In August 2011, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced the first-ever program to reduce greenhouse gas emissions and improve fuel efficiency of heavy-duty trucks and buses. The EPA and the NHTSA have each adopted complementary standards under their respective authorities covering model years 2014–2018, which together form a comprehensive Heavy-Duty National Program. The goal of the joint rulemakings is to present coordinated federal standards that help manufacturers to build a single fleet of vehicles and engines that are able to comply with both. The EPA and the NHTSA have adopted standards for CO_2 emissions and fuel consumption, respectively, tailored to each of three main regulatory categories: (1) combination tractors; (2) heavy-duty pickup trucks and vans; and (3) vocational vehicles. The EPA has additionally adopted standards to control HFC leakage from air conditioning systems in pickups and vans and combination tractors. Also exclusive to the EPA program are the EPA's N_2O and CH_4 standards that will apply to all heavy-duty engines, pickups, and vans. For purposes of this program, the heavy-duty fleet incorporates all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds, and the engines that power them, except those covered by the current GHG emissions and Corporate Average Fuel Economy standards for model year 2012–2016 passenger vehicles.

The Heavy-Duty National Program is projected to reduce fuel use and GHG emissions from medium- and heavy-duty vehicles, from semi trucks to the largest pickup trucks and vans, as well as all types and sizes of work trucks and buses in between. Vehicles covered by this program make up the transportation segment's second largest contributor to oil consumption and GHG emissions. This comprehensive program is designed to address the urgent and closely intertwined challenges of dependence on oil, energy security, and global climate change. The EPA and the NHTSA estimate that the combined standards will reduce CO_2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of vehicles built for the 2014 to 2018 model years, providing $49 billion in net program benefits. A second phase of regulations is planned for model years beyond 2018. The goals would include spurring innovation as well as updating the assessment of actual emissions and fuel use from this sector. Such future regulation would also be designed to align with similar programs developed outside the United States.

STATE

Executive Order S-3-05

Executive Order S-3-05 proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of CalEPA created a Climate Action Team (CAT) made up of members from various state agencies and commissions. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases regulated by AB 32 include CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions phased in starting in 2012. To effectively implement the cap, AB 32 directs the California Air Resources Board (CARB) to develop and implement regulations to reduce statewide GHG emissions from stationary sources.

AB 32 requires that CARB adopt a quantified cap on greenhouse gas emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

AB 32 Scoping Plan

As noted above, on December 11, 2008, CARB adopted the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. CARB determined that achieving the 1990 emission level would require a reduction of GHG emissions of approximately 29 percent below what would otherwise occur in 2020 in the absence of new laws and regulations (referred to as "business as usual"). The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. Additional development of these measures and adoption of the appropriate regulations will occur through the end of year 2013. The key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;

- Achieving a statewide renewables energy mix of 33 percent;

- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;

- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, heavy-duty truck measures, and the Low Carbon Fuel Standard; and

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation (CARB 2008a).

In 2009, a coalition of special interest groups brought a challenge to the Scoping Plan alleging that it violated AB 32 and that the environmental review document (called a "Functional Equivalent Document") violated CEQA by failing to appropriately analyze alternatives to the proposed cap-and-trade program. On May 20, 2011, the San Francisco Superior Court entered a final judgment ordering that CARB take no further action with respect to cap-and-trade rulemaking until it complies with CEQA. While CARB disagrees with the trial court finding and appealed the decision on May 23, 2011, in order to remove any doubt about the matter and in keeping with CARB's interest in public participation and informed decision-making, CARB revisited the alternatives. The revised analysis includes the five alternatives included in the original environmental analysis: a "no project" alternative (that is, taking no action at all); a plan relying on a cap-and-trade program for the sectors included in a cap; a plan relying more on source-specific regulatory requirements with no cap-and-trade component; a plan relying on a carbon fee or tax; and a plan relying on a variety of proposed strategies and measures. The public hearing to consider approval of the AB 32 Scoping Plan Functional Equivalent Document and the AB 32 Scoping Plan was held on August 24, 2011. On this date, CARB re-approved the Scoping Plan.

In August 2012, CARB released revised estimates of the expected 2020 emissions reductions. The revised analysis relies on emissions projections updated in light of current economic forecasts which account for the economic downturn since 2008 as well as reduction measures already approved and put in place. This reduced the projected 2020 emissions from 596 million metric tons (MMT) CO_2e to 545 $MMTCO_2e$. The reduction in projected 2020 emissions means that the revised business-as-usual (BAU) reduction necessary to achieve AB 32's goal of reaching 1990 levels by 2020 is now only 21 percent.

2013 Draft Climate Change Scoping Plan – First Update

As required by AB 32 legislation, CARB is required not only to prepare a scoping plan but also update the scoping plan at least once every five years (Health and Safety Code Section 38561(h)). In October 2013, a draft of the 2013 Update to the Climate Change Scoping Plan was publicly released. The 2013 update focuses on answering three key questions related to progress toward achieving the GHG reduction goals of AB 32:

a. How have GHG emissions changed since the passage of AB 32 and implementation of early action items?

b. What actions must continue to meet the prescribed course of action to 2020?

c. What steps must be taken in the coming years to continue cutting emissions and growing the economy to meet long-term climate goals?

It is anticipated that CARB will formally adopt the updated AB 32 Scoping Plan in early 2014.

Senate Bill 375

Senate Bill (SB) 375 (codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.01, 65584.04, 65584.04, 65587, 65588, 14522.1, 14522.2, 65080.01 and Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

LOCAL

Mojave Desert Air Quality Management District

The Mojave Desert Air Quality Management District (MDAQMD) is the air quality regulating authority with jurisdiction over the desert portion of San Bernardino County, known as the Mojave Desert Air Basin (MDAB). The MDAB includes a portion of Kern County, Los Angeles County, Riverside County, and San Bernardino County. The project site is located within the MDAB; therefore, the MDAQMD retains air quality–related regulatory authority over the proposed project.

In August 2011, the MDAQMD revised the air district's CEQA and federal conformity guidelines, which provide background information and guidance on the district's preferred analysis approach. The revisions established significant emissions thresholds for greenhouse gases of 100,000 tons per year or 548,000 pounds per day.

South Coast Air Quality Management District

To provide guidance to local lead agencies on determining significance for greenhouse gas emissions in CEQA documents, South Coast Air Management District (SCAQMD) staff is convening an ongoing GHG CEQA Significance Threshold Working Group. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that provide input to the SCAQMD staff on developing the significance thresholds. On October 8, 2008, the SCAQMD released the Draft AQMD Staff CEQA GHG Significance Thresholds. These thresholds have not been finalized and continue to be developed through the working group.

On September 28, 2010, SCAQMD Working Group Meeting #15 considered use of the 6.6 metric tons per service population metric as a threshold for plan-level analysis, though it has not adopted any thresholds for the land use sector to date. Thus, it is only a concept that has been discussed at the staff level and is not a SCAQMD recommendation at this time. Furthermore, the SCAQMD's staff concept (as indicated in the September 28, 2010, working group presentation) is that the service population metric is only employed for significance determination after considering whether a CEQA plan or project is consistent with a climate action plan.

As of SCAQMD staff's meeting on September 28, 2010, the draft tiered threshold provides the following guidance:

- **Tier 1:** Is the project exempt from CEQA? If yes, the project is not significant and no further analysis is required.
- **Tier 2:** Is the project consistent with an approved regional climate action plan? If yes, the project is not significant and no further analysis is required.
- **Tier 3:** Would the project result in emissions below the screening level criteria? If yes, the project is not significant and no further analysis is required.
  - Propose 10,000 metric tons (MT) per year CO_2e industrial project threshold for use by all lead agencies
  - Propose 3,000 MT per year CO_2e for all residential and commercial land use types
  - Threshold value by land use type acceptable if used consistently
  - Residential: 3,500 MT/year CO_2e
  - Commercial: 1,400 MT/year CO_2e
  - Mixed use: 3,000 MT/year CO_2e
  - Both options based on review of the Office of Planning Research (OPR) database (711 CEQA projects) using the 90 percent capture rate approach
- **Tier 4**: Would the project comply with certain performance-based standards? If yes, the project is not significant and no further analysis is required.
  - Option #1: Percent Emission Reduction Target
    - No recommendation at this time
  - Option #2: Early Implementation of Applicable AB 32 Scoping Plan Measures
    - Incorporated in Option #3
  - Option #3: SCAQMD Efficiency Target
    - 2020 Targets – 4.8 MT/year CO_2e per service population (SP) for project-level threshold (land use employment only)
    - 2035 Targets – 3.0 MT/year CO_2e per SP for project-level threshold

The SCAQMD has not announced when staff is expecting to present a finalized version of these thresholds to the Governing Board. The SCAQMD has also adopted Rules 2700, 2701, and 2702 that address GHG reductions; however, these rules are currently applicable only to boilers and process heaters, forestry, and manure management projects.

San Bernardino County Greenhouse Gas Reduction Plan

In September 2011, San Bernardino County adopted a Greenhouse Gas Reduction Plan and amended the General Plan to include a policy addressing the County's intention to reduce GHG emissions that are reasonably attributable to (1) the County's internal activities, services, and facilities; and (2) private industry and development that is located within the area subject to the County's land use and building permit authority.

Additionally, the GHG reduction plan included a Development Code Amendment (GHG Plan Appendix F) to ensure the development review process and procedures to provide certainty in how projects should evaluate GHG emissions and determine significance for CEQA purposes are streamlined by (1) applying a uniform set of performance standards to all development projects, and (2) utilizing Screening Tables to mitigate project GHG emissions. The development review process was designed to streamline project analysis related to GHG emissions analysis and ensure the elements of the GHG reduction plan are appropriately implemented, when applicable to certain project types and land uses. The applicable portions of the development review process are described below.

a. County Performance Standards. All development projects, including those otherwise determined to be exempt from CEQA, are subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 $MTCO_2e$ per year are considered to be consistent with the plan and determined to have a less than significant individual and cumulative impact for GHG emissions.

b. Regulatory Agency Performance Standards. When, and if, the South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.

c. Projects Using Screening Table. For projects exceeding 3,000 $MTCO_2e$ per year of GHG emissions, the County uses Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. Projects that garner 100 or greater points would not require quantification of project-specific GHG emissions. The point system was devised to ensure project compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those of existing development, allow the County to meet its 2020 target and support reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the plan and therefore have a less than significant individual and cumulative impact for GHG emissions.

d. Projects Not Using Screening Tables. Projects exceeding 3,000 $MTCO_2e$ of GHG emissions that do not use the Screening Tables are required to quantify project-specific GHG emissions and achieve the equivalent level of GHG emissions efficiency as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the plan and therefore are determined to have a less than significant individual and cumulative impact for GHG emissions.

3.6.3 IMPACTS AND MITIGATION MEASURES

To meet the GHG emission targets of AB 32, California would need to generate less GHG emissions in the future than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32. Moreover, emitting CO_2 into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of GHG emissions in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of GHGs into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of GHGs emitted by the project would result in any altered conditions.

However, the State of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California that should be addressed under CEQA. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global warming (Health and Safety Code Section 38501[a]). In response to the relative lack of guidance on addressing GHGs and climate change, SB 97 was passed in order to amend CEQA by directing the Office of Planning and Research to prepare revisions to the State CEQA Guidelines addressing the mitigation of GHGs or their consequences.

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the application of the following State CEQA Guidelines Appendix G thresholds of significance:

1) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

In its Final Statement of Reasons for Regulatory Action accompanying the CEQA Amendments (FSOR), the California Natural Resources Agency (CNRA) (2009) explains that quantification of GHG emissions "is reasonably necessary to ensure an adequate analysis of GHG emissions using available data and tools" and that "quantification will, in many cases, assist in the determination of significance." However, as explained in the FSOR, the revised Section 15064.4(b) assigns lead agencies the discretion to determine the methodology to quantify GHG emissions. The FSOR also notes that CEQA case law has long stated that "there is no iron-clad definition of 'significance.' Accordingly, lead agencies must use their best efforts to investigate and disclose all that they reasonably can, concerning a project's potential adverse impacts."

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. Through the development of the San Bernardino County Greenhouse Gas Reduction Plan, and associated amendments to the development review process, significance thresholds for GHG emissions resulting from land use development projects have been

established in San Bernardino County. Determining thresholds of significance for a project's climate change impacts poses a special difficulty for lead agencies. Much of the science in this area is new and is evolving constantly. At the same time, neither the state nor local agencies are specialized in this area, nor are there currently any specific regional or state thresholds that have been adopted based on substantial evidence to determine whether the proposed project has a significant impact on climate change. The CEQA Guidelines do not prescribe specific significance thresholds but instead leave considerable discretion to lead agencies to develop appropriate thresholds to apply to projects within their jurisdiction.

As noted earlier, AB 32 is a legal mandate requiring that statewide GHG emissions be reduced to 1990 levels by 2020. In adopting AB 32, the legislature determined the necessary GHG reductions for the state to make in order to sufficiently offset its contribution to the cumulative climate change problem to reach 1990 levels. AB 32 is the only legally mandated requirement for the reduction of greenhouse gases. As such, compliance with AB 32 is the adopted basis on which the agency can base its significance threshold for evaluating the project's GHG impacts.

Because the County's Greenhouse Gas Reduction Plan and associated thresholds were prepared for the purpose of complying with the requirements of AB 32, and are based on substantial evidence, as detailed in the GHG Reduction Plan, the 3,000 $MTCO_2e$ per year threshold is used as the significance threshold concerning project generation of GHG emissions for this project. Additionally, the GHG Reduction Plan threshold is also the most restrictive of the three screening criteria (proposed as 100,000 tons per year by the MDAQMD or 10,000 $MTCO_2e$ by the SCAQMD). Therefore, should the project meet the thresholds identified by the GHG Reduction Plan, it would meet all three screening criteria thresholds. The project would be considered to contribute substantially to a cumulative impact and the impact would be considered significant if the projected emissions would surpass 3,000 $MTCO_2e$ annually.

In terms of project conformance with an applicable plan to reduce GHG emissions, the project is compared specifically to San Bernardino County's Greenhouse Gas Reduction Plan. The plan was designed to be consistent with the San Bernardino County General Plan and further implement the strategies of AB 32, the AB 32 Scoping Plan, SB 375, and the Southern California Association of Governments' Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

This DEIR assesses the proposed project's potential to result in a significant GHG impact by determining its consistency with the applicable thresholds of significance and comparison to the applicable GHG-reducing strategies of San Bernardino County's Greenhouse Gas Reduction Plan. By determining that the proposed project is consistent with the GHG reduction plan, it can be determined that the project is also consistent with the state-level plans, policies, and regulations adopted as a result of AB 32 and SB 375 for the purposes of reducing GHG emissions.

METHODOLOGY

The GHG emissions of the proposed project were calculated by Sespe Consulting, Inc., and independently reviewed by Urban Crossroads, Inc., and PMC. **EIR Appendix C** contains the detailed analysis, including assumptions and results. Both the baseline and proposed project GHG emissions were calculated using methods and parameters from the Mineral Industry Emissions Inventory Guidance, AP-42, EMFAC2011, OFFROAD2011, and the California Emissions

Estimator Model (CalEEMod), version 2011.1.1.[1] CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals. This model is the most current emissions model approved for use in California by various air districts.

PROJECT IMPACTS AND MITIGATION MEASURES

Generate Greenhouse Gas Emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment (Standard of Significance 1)

Impact 3.6.1 Implementation of the proposed project would result in an incremental increase of 1,893 $MTCO_2e$ per year. Thus, the proposed project would neither directly or indirectly generate more than 3,000 $MTCO_2e$ per year and would result in a **less than cumulatively considerable** impact relating to GHG emissions.

GHG emissions are generated both on- and off-site through the use of diesel generators and vehicles or equipment used in the excavation, crushing, or transportation process. **EIR Appendix C** provides a full analysis of the GHG emissions generated by type of equipment and estimated annual use for both the baseline and proposed project conditions.

The baseline conditions report estimates that the Sentinel-Butterfield Quarry transports 378,217 tons per year to the Lucerne Valley processing plant and the White Knob Quarry transports 275,418 tons per year, for a total of 653,635 tons per year transported to the processing plant. The processing plant is physically limited to processing 680,000 tons per year. The proposed project would allow the processing plant maximum capacity to be excavated exclusively from the White Knob Quarry, which would result in all quarry operations at the Sentinel-Butterfield Quarry to cease. With the overall proposed change in operations, this analysis incorporates both the increased operations at White Knob as well as the decreased operations at Sentinel-Butterfield.

Baseline operations at the White Knob and Sentinel-Butterfield Quarries generate an estimated 20,725 $MTCO_2e$ per year. As a worst case scenario, should all ore sent to the processing plant come from the White Knob Quarry, a maximum of 680,000 tons per year as this is the limit of ore that is permitted to be processed at the Omya processing plant, the White Knob Quarry emissions would increase by 9,435 $MTCO_2e$/yr. However, if the maximum capacity of the processing plant is met exclusively from the White Knob Quarry, operations at the Sentinel-Butterfield quarry would cease and would result in reduced emissions of 7,542 $MTCO_2e$ per year. The proposed project therefore would result in a maximum increase of 1,893 $MTCO_2e$ per year (see **Table 3.6-3**).

[1] While the project is limited to expanding the White Knob/White Ridge Quarries areas, overall combined production from all quarries is limited by the processing plant maximum production rate. The project would allow up to the maximum production rate to be extracted exclusively from the White Knob and White Ridge Quarries. This would result in no material being quarried at the Butterfield and Sentinel Quarries, which is an indirect effect of the project that necessitates calculation of Butterfield and Sentinel Quarries emissions in the baseline.

TABLE 3.6-3
BASELINE AND PROJECT EMISSIONS ($MTCO_2E$ PER YEAR)

Emissions Source	Ore Hauled to Plant (tons per year)	Emissions ($MTCO_2e$/yr)
Baseline (White Knob)	275,418	13,183
Baseline (Butterfield-Sentinel)	378,217	7,542
Baseline (White Knob + Butterfield-Sentinel)	653,635	20,725
White Knob Project Emissions (Proposed Project)	680,000	+9,435
Sentinel-Butterfield Reduced Emissions from ceased operations	0	-7,542
Total Change	**26,365**	**1,893**

Source: EIR Appendix C, Sespe 2013

Mitigation Measures

None required.

Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases (Standard of Significance 2)

Impact 3.6.2 Implementation of the proposed project is consistent with San Bernardino County's Greenhouse Gas Reduction Plan, the county's applicable plan adopted for the purpose of reducing the emissions of greenhouse gases. This impact is **less than cumulatively considerable.**

As previously mentioned, the County's Greenhouse Gas Reduction Plan identifies a path for achieving consistency with the AB 32 GHG reduction goals, through the reduction of baseline emissions by 15 percent by 2020 (to 5,296,034 $MTCO_2e$ for external emissions and to 256,712 $MTCO_2e$ for internal emissions).

The plan describes the reduction strategies currently being employed by the County, as well as those that will be employed by the County, through implementation of the GHG Plan, and by the State, through a variety of legislation and regulations. The combination of existing reduction strategies and proposed new strategies identified in the reduction plan will be assembled into an integrated plan to reduce the countywide GHG emissions level. In addition, proposed new private developments will also contribute to GHG emissions reduction through the County's GHG development review process, AB 32 requirements, and other state initiatives.

The GHG emissions reduction measures identified in the Greenhouse Gas Reduction Plan include existing and proposed state, regional, county, and other local measures that would reduce GHG emissions from the county in both the internal and external categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures, i.e., state, regional, or local, and also whether the measure is quantifiable in terms of calculating a volume of emission reduction. The emissions reduction measures are organized as follows for each sector:

- Reduction Class 1 (R1) includes adopted, implemented, and proposed state and regional measures that do not require additional County action and that will result in GHG reductions for the County's land use authority area and internal operations. These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.

- Reduction Class 2 (R2) includes measures currently implemented or in the process of implementation by the County, as well as any additional quantifiable measures that require County action and will further reduce the GHG emissions for the County's land use authority area and internal operations. R2 also includes any state and regional measures that require substantial action by the County to achieve the expected GHG reductions. These measures are specific, quantifiable measures as well as reductions achieved through the development review process.

  Measurable reductions of GHG emissions will be achieved through the County's development review process by applying appropriate reduction requirements as part of the discretionary approval of new development projects. Through the development review process, the County will implement CEQA, requiring new development projects to quantify project GHG emissions and adopt feasible mitigation to reduce project emissions below a level of significance. The CEQA process for evaluating GHG impacts and determining significance will be streamlined as follows:

  a. County Performance Standards. All development projects, including those otherwise determined to be exempt from CEQA, are subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 $MTCO_2e$ per year are considered to be consistent with the plan and determined to have a less than significant individual and cumulative impact for GHG emissions.

  b. Regulatory Agency Performance Standards. When, and if, the South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.

  c. Projects Using Screening Table. For projects exceeding 3,000 $MTCO_2e$ per year of GHG emissions, the County uses Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. Projects that garner 100 or greater points would not require quantification of project-specific GHG emissions. The point system was devised to ensure project compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those of existing development, allow the County to meet its 2020 target and support reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the plan and therefore have a less than significant individual and cumulative impact for GHG emissions.

d. Projects Not Using Screening Tables. Projects exceeding 3,000 $MTCO_2e$ of GHG emissions that do not use the Screening Tables are required to quantify project-specific GHG emissions and achieve the equivalent level of GHG emissions efficiency as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the plan and therefore are determined to have a less than significant individual and cumulative impact for GHG emissions.

- Reduction Class 3 (R3) includes additional measures that were not used to demonstrate achievement of the proposed County's 2020 GHG emissions reduction target. For these measures, emissions reductions have either not been quantified due to a lack of available data or protocols required for quantification or because of uncertainty regarding the County's jurisdictional control over relevant emissions sources. Some of these measures are quantifiable but require additional refinement and are therefore not included in R1 or R2.

As noted in the Greenhouse Gas Reduction Plan's discussion of Reduction Class 2 (R2), by meeting San Bernardino County's "applicable Development Code provisions including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency," projects that are exempt from CEQA and small projects that do not exceed 3,000 $MTCO_2e$ per year are considered to be consistent with the plan and determined to have a **less than cumulatively considerable** impact for GHG emissions. The proposed project will not exceed 3,000 $MTCO_2e$ per year and is therefore consistent with the applicable plans and policies adopted for the purpose for reducing GHG emissions.

Mitigation Measures

None required.