APPENDIX B

Air Quality and Greenhouse Gas Emissions Technical Report

Air Quality and Greenhouse Gas Technical Report for the Brasada Residential Project

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CONTENTS

1.0 Introduction 1

2.0 Project Description 1

3.0 Environmental Setting 2

3.1 Climate and Meteorology 2

3.2 Criteria Air Pollutants 7

3.3 Greenhouse Gas Emissions Overview 10

4.0 Air Quality and GHG Emissions Regulations 14

4.1 Federal 14

4.2 State 16

4.3 Local 20

5.0 Existing Air Quality 25

6.0 Project Impacts and Mitigation 27

6.1 Consistency with Regional Plans 27

6.2 Conformance to Federal and State Ambient Air Quality Standards 28

6.3 Impacts to Sensitive Receptors 33

6.4 Objectionable Odors 38

6.5 Cumulative Impacts 38

6.6 Greenhouse Gas Emissions and Conflicts With Adopted Plans 41

7.0 References 57

Appendix A. Air Quality and GHG Data

Figures

Figure 1 Proposed Project Site Plan 3
Figure 2 Regional Vicinity Map 5

Tables

Table 1 Global Warming Potentials and Atmospheric Lifetimes of Common GHGs 12
Table 2 National and California Ambient Air Quality Standards 15
Table 3 Attainment Status for the South Coast Air Basin 16
Table 4 Required Best Available Control Measures for Fugitive Dust 23
Table 5 Contingency Control Measures for Fugitive Dust During High Winds 25
Table 6 Ambient Air Quality Monitoring Summary 26
Table 7 Comparison between Regional and City of San Dimas Population Estimates 28
Table 8 SCAQMD Thresholds of Significance 29
Table 9 Approximate Duration of Project Construction Phases 30
Table 10 Construction Maximum Daily Emissions 31
Table 11 Operational Maximum Daily Emissions 31
Table 12 Mitigated Construction Daily Maximum Emissions 33
Table 13 Daily Localized Construction Thresholds for Source Receptor Area 10 34
Table 14 Localized Construction Emissions Concentrations 37
Table 15 Mitigated Localized Construction Emissions Concentrations 38
Table 16 Estimated GHG Emissions from Project Construction 43
Table 17 Estimated Annual Operational GHG Emissions 43
Table 18 GHG Emission Reductions Estimates for Project Design Features 47
Table 19 GHG Emission Reductions Estimates for Project-Incorporated Measures 53

1.0 Introduction

This air quality and greenhouse gas (GHG) emission evaluation was prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) to assess if any potentially significant air quality or GHG impacts would occur in conjunction with the type and scale of development associated with the proposed Brasada Residential project (project).

2.0 Project Description

The project would subdivide approximately 270 acres into 61 single-family residential lots (or "numbered lots"); seven common area lots (or "lettered lots") including private roadways; one remainder parcel that is anticipated to remain open space and/or habitat conservation land that would be offered for dedication to the City or a conservancy; related infrastructure including entry gates, utilities, water quality control basins and a water storage facility; and an easement for a 2.8-acre portion of property to the south for the purpose of access, drainage, grading, utilities, landscaping and maintenance. For the purpose of this CEQA analysis, it is assumed that build out of the 61 single-family homes would occur, although the actual residences would not be developed as part of the proposed project. The project site, including the Tentative Tract Map (TTM) and the 2.83-acre easement area consists of a total acreage of approximately 273 acres. Total disturbance on the project site resulting from the project would be approximately 90 acres, of which 10 acres would be short-term non-permanent disturbance occurring during construction. Figure 1 provides an overview of the proposed TTM.

The project is located in the foothills of the San Gabriel Mountains in the northern portion of the city of San Dimas, as shown in Figure 2. This portion of the city is commonly referred to as the Northern Foothills. The project site is located entirely within the city. Generally, the project area lies north of Foothills Boulevard, and is bounded by the boundary of the city of Glendora to the west. Properties to the north and east of the project contain a mix of private and public lands, and are largely undeveloped. The southern portion of the project site is bounded by single-family residential development. Currently, the project site is undeveloped and vacant, with the exception of a caretaker's quarters, stable, and barn, and is located in hilly terrain that is cut by numerous canyons and drainages.

The residential lots would range in size from 0.5 acres to 17.8 acres, with an overall average lot size of two acres. Pad sizes on the residential lots would average 25,204 square feet, with a range of 13,485 to 70,559 square feet. The proposed single-family residences would range in size from approximately 4,000 to 15,000 square feet, with the average home size estimated to be between approximately 5,000 to 6,000 square feet. Some residential lots would include designated "no build areas" that would serve as open space. Sixteen lots would be designated for construction of two-story structures. In addition, another six lots would be created with a split pad, meaning that a grade separation would occur on these lots. Residential lots would have setbacks of 25 feet (front yard, from curb), 25 feet combined (side yard) and 20 feet (rear). Parking would be accommodated on each individual lot.

Primary access to the project site would be from a gated entryway to a private road beginning at the existing northern terminus of Cataract Avenue. This gated entrance would be constructed with a median and a turnaround area prior to the gateway. Beyond the gateway, the main project roadway, identified as "Brasada Lane" on the TTM, would be a 26-foot wide (curb-to-curb) paved private road.

Brasada Lane would serve as the principal roadway for the project, and several spur roadways, also 26-feet wide, would lead from Brasada Lane into other portions of the site. Several additional roadways, each 20 feet in width (curb-to-curb) would branch off of the above roadways and lead to other residential lots not located within the principal lot cluster.

3.0 Environmental Setting

3.1 Climate and Meteorology

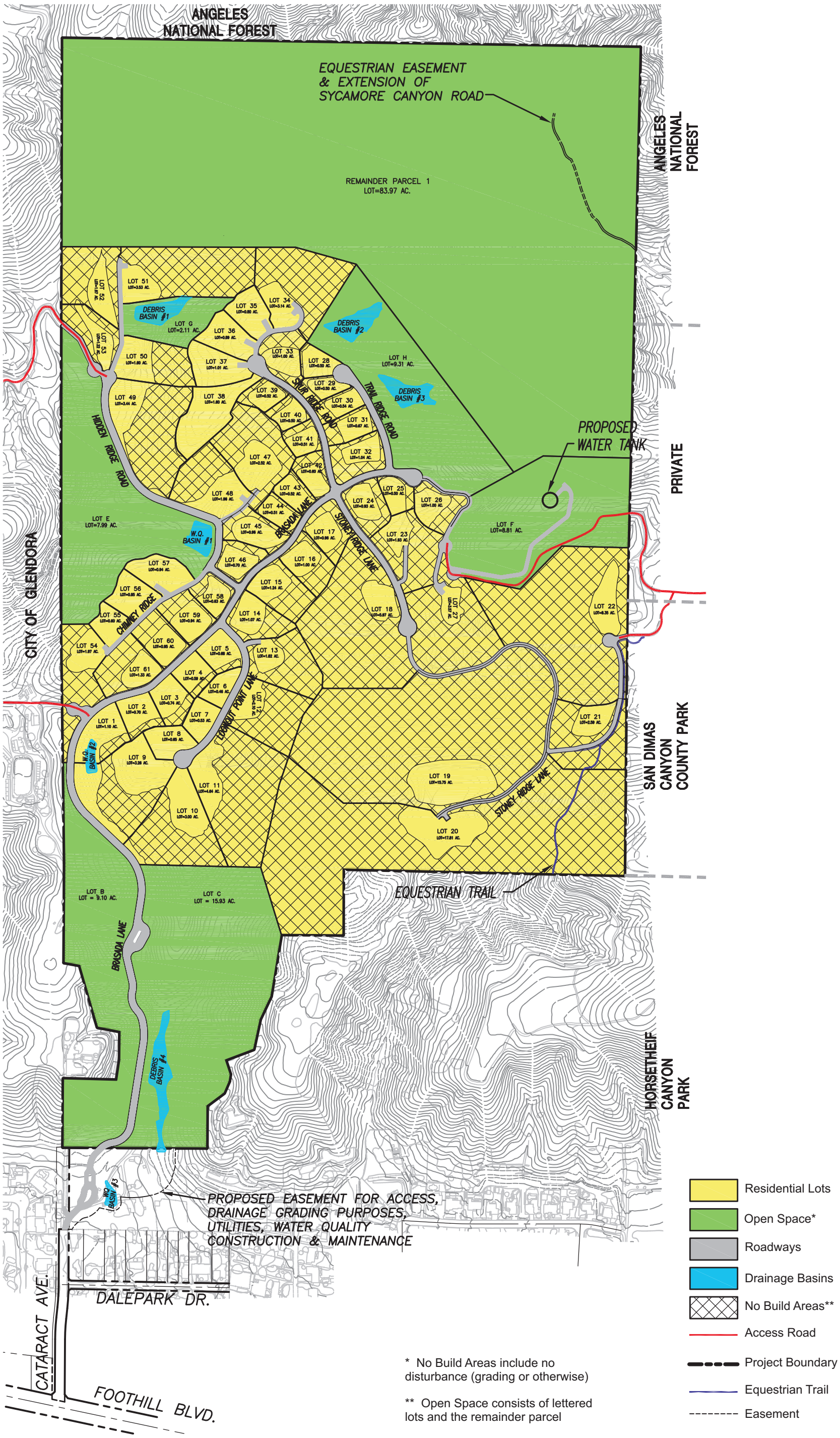
The proposed project is located in the South Coast Air Basin (Basin). This Basin includes the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. The Basin is located in a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station located nearest to the project site is the San Dimas Fire Station FC95; however, this station does not have sufficient temperature data recorded. The next closest station, the Pomona Fairplex Station, reports an average mean temperature of 62.5°F between 1893 and 2009. The average annual low is reported as 47.5°F, while the average high is reported as 77.5°F (Western Regional Climate Center 2010a).

Rainfall is seasonally and annually variable. Almost all rain falls from November through April. Summer rainfall is normally restricted to scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. The annual average precipitation recorded at the San Dimas Fire Station FC95 between 1906 and 2009 was 18.5 inches. The wettest month of the year is January with an average rainfall of 4.31 inches in the project area (Western Regional Climate Center 2010b).

Although the Basin has a semi-arid climate, the air near the surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by off shore winds, the ocean effect is dominant. Periods of heavy fog, especially along the coastline, are frequent; and low stratus clouds, often referred to as “high fog,” are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the east portions of the Basin.

Wind patterns across the south coastal region are characterized by westerly and southwesterly onshore winds during the day and easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season. Annually, typical winds in the project area average about four miles per hour.



* No Build Areas include no disturbance (grading or otherwise)

** Open Space consists of lettered lots and the remainder parcel

Source: FUSCOE Engineering 2010

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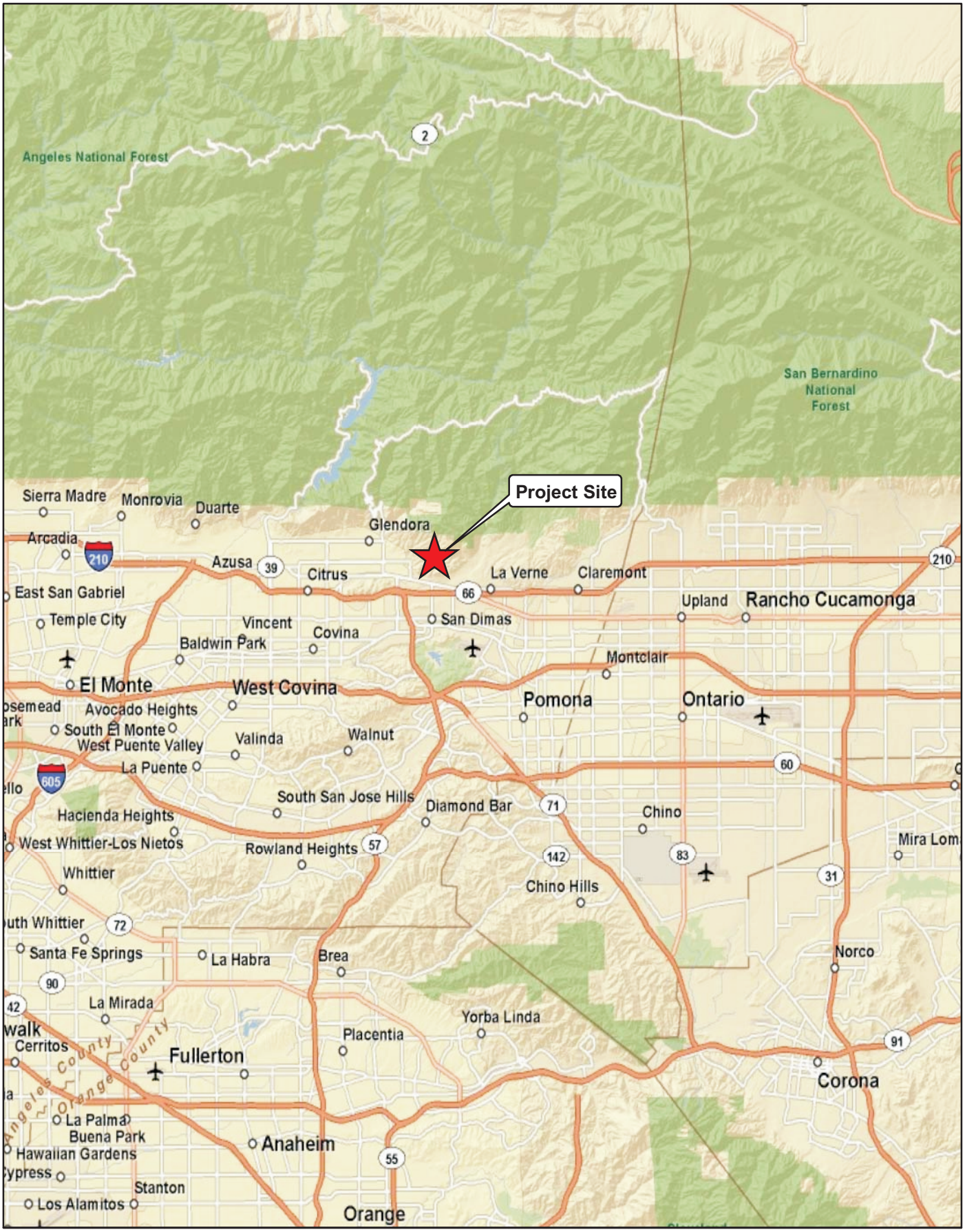
No Scale

N

PROPOSED PROJECT SITE PLAN
FIGURE 1



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Source: ESRI 2010

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0 2.5 5
Miles

N

REGIONAL VICINITY MAP
FIGURE 2

Between the periods of dominant airflow, periods of air stagnation may occur both in the morning and evening hours. Whether such a period of stagnation occurs is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the Basin, combined with other meteorological conditions, can result in very strong, down slope Santa Ana winds. These winds normally last a few days before predominant meteorological conditions are reestablished.

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These inversions are the marine/subsidence inversion and the radiation inversion. The height of the base of the inversion at any given time is known as the "mixing height." This mixing height can change under conditions when the top of the inversion does not change. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area.

3.2 Criteria Air Pollutants

Federal and state laws regulate the air pollutants emitted into the ambient air by stationary and mobile sources. These regulated air pollutants are known as "criteria air pollutants" and are categorized as primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and most fine particulate matter including lead (Pb) and fugitive dust (PM_{10} and $PM_{2.5}$) are primary air pollutants. Of these, carbon monoxide, SO_2, PM_{10}, and $PM_{2.5}$ are criteria pollutants. ROGs and NO_x are criteria pollutant precursors that go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone and nitrogen dioxide (NO_2) are the principal secondary pollutants. Diesel particulate matter is a mixture of particles and is a component of diesel exhaust. The U.S. Environmental Protection Agency (EPA) lists diesel exhaust as a mobile source air toxic due to the cancer and noncancer health effects associated with exposure to whole diesel exhaust.

Presented below is a description of each of the primary and secondary criteria air pollutants and their known health effects.

Carbon Monoxide (CO) is an odorless, colorless, and toxic gas. Because it is impossible to see, taste, or smell the toxic fumes, carbon monoxide can kill people before they are aware that it is in their homes. At lower levels of exposure, carbon monoxide causes mild effects that are often mistaken for the flu. These symptoms include headaches, dizziness, disorientation, nausea, and fatigue. The effects of carbon monoxide exposure can vary greatly from person to person depending on age, overall health, and the concentration and length of exposure (EPA 2010b). The major sources of carbon monoxide in the Basin are on-road vehicles, aircraft, and off-road vehicles and equipment.

Reactive Organic Gases (ROGs) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. ROGs consist of non-methane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Non-methane hydrocarbons are hydrocarbons that do not contain the un-reactive

hydrocarbon, methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

It should be noted that there are no state or national ambient air quality standards for ROGs because they are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROGs are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility. Although health-based standards have not been established for ROGs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, higher concentrations of ROGs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, kidneys, and central nervous system (EPA 1999).

The major sources of ROGs in the Basin are on-road motor vehicles and solvent evaporation. Benzene, a ROG and known carcinogen, is emitted into the air from gasoline service stations (fuel evaporation), motor vehicle exhaust, tobacco smoke, and from burning oil and coal. Benzene is also sometimes used as a solvent for paints, inks, oils, waxes, plastic, and rubber. It is used in the extraction of oils from seeds and nuts. It is also used in the manufacture of detergents, explosives, dyestuffs, and pharmaceuticals. Short-term (acute) exposure of high doses of benzene from inhalation may cause dizziness, drowsiness, headaches, eye irritation, skin irritation, and respiratory tract irritation. At higher levels, unconsciousness can occur. Long-term (chronic) occupational exposure of high doses by inhalation has caused blood disorders, including aplastic anemia and lower levels of red blood cells (EPA 1999).

Nitrogen Oxides (NO_x) serve as integral participants in the process of photochemical smog production. The two major forms of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown, irritating gas formed by the combination of NO and oxygen. NO_x acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens. NO_x is also an ozone precursor. A precursor is a directly emitted air contaminant that, when released into the atmosphere, forms, causes to be formed, or contributes to the formation of a secondary air contaminant for which a National Ambient Air Quality Standard (NAAQS) has been adopted, or whose presence in the atmosphere will contribute to the violation of one or more NAAQS. When NO_x and ROGs are released in the atmosphere, they chemically react with one another in the presence of sunlight to form ozone.

Nitrogen dioxide (NO_2) is a byproduct of fuel combustion. The principal form of NO_2 produced by combustion is nitrogen oxide (NO). NO reacts with oxygen in the air to form NO_2 creating the mixture of NO and NO_2 commonly called NO_x. Other oxides of nitrogen including nitrous acid and nitric acid are part of the nitrogen family. While the EPA's NAAQS covers this entire family, NO_2 is the component of greatest interest and the indicator for the larger group of NO_x.

Ozone (O_3) is one of a number of substances called photochemical oxidants that are formed when reactive organic compounds (ROC) and NO_x (both byproducts of the internal combustion engine) react with sunlight. Ozone is present in relatively high concentrations in the Basin, and the damaging effects of photochemical smog are generally related to ozone concentrations. Ozone may pose a health threat to those who already suffer from respiratory diseases as well as healthy people. Additionally, ozone has been tied to crop damage, typically in the form of stunted growth and pre-mature death. Ozone can also act as a corrosive, resulting in property damage such as the embitterment of rubber products.

Lead (Pb) is a solid heavy metal that can exist in air pollution as an aerosol particle component. An aerosol is a collection of solid, liquid, or mixed-phase particles suspended in the air. Lead was first regulated as an air pollutant in 1976. Leaded gasoline was first marketed in 1923 and was used in motor vehicles until around 1970. The exclusion of lead from gasoline helped to decrease emissions of lead in the United States from 219,000 to 4,000 tons per year between 1970 and 1997. Even though leaded gasoline has been phased out in most countries, some, such as Egypt and Iraq, still use at least some leaded gasoline (United Nations Environment Programme 2010). Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and physical weathering of surfaces containing lead. The mechanisms by which lead can be removed from the atmosphere (sinks) include deposition to soils, ice caps, oceans, and inhalation.

Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. The more serious effects of lead poisoning include behavioral disorders, mental retardation, and neurological impairment. Low levels of lead in fetuses and young children can result in nervous system damage, which can cause learning deficiencies and low intelligence quotients (IQs). Lead may also contribute to high blood pressure and heart disease. Lead concentrations once exceeded the state and national air quality standards by a wide margin but have not exceeded these standards at any regular monitoring station since 1982. Lead is no longer an additive to normal gasoline, which is the main reason that concentration of lead in the air is now much lower. The proposed project would not emit lead; therefore, lead has been eliminated from further review in this analysis.

Sulfur Dioxide (SO_2) is a colorless, pungent gas. At levels greater than 0.5 parts per million (ppm), the gas has a strong odor, similar to rotten eggs. Sulfuric acid is formed from SO_2 and is an aerosol particle component that may lead to acid deposition. Acid deposition into water, vegetation, soil, or other materials can harm natural resources and materials. Sulfur oxides (SO_x) include SO_2 and sulfur trioxide (SO_3). Although SO_2 concentrations have been reduced to levels well below state and national standards, further reductions are desirable because SO_2 is a precursor to sulfates. Sulfates are a particulate formed through the photochemical oxidation of SO_2. Long-term exposure to high levels of SO_2 can cause irritation of existing cardiovascular disease, respiratory illness, and changes in the defenses in the lungs. When people with asthma are exposed to high levels of SO_2 for short periods of time during moderate activity, effects may include wheezing, chest tightness, or shortness of breath.

Particulate Matter (PM) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulate, also known as fugitive dust, are now recognized. Course particles, or PM_{10}, include that portion of the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 one-millionths of a meter or 0.0004 inch) or less. Fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns, that is 2.5 one-millionths of a meter or 0.0001 inch or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities; however, wind action on the arid landscape also contributes substantially to the local particulate loading. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems. The South Coast Air Quality Management District (SCAQMD) recently promulgated both regional and localized emissions thresholds for $PM_{2.5}$. These are based on the proposed EPA standard of 10 tons per year as included in the Federal Register, September 8, 2005.

Fugitive dust poses primarily two public health and safety concerns. The first concern is that of respiratory problems attributable to the suspended particulates in the air. The second concern is that of motor vehicle accidents caused by reduced visibility during severe wind conditions. Fugitive dust may also cause significant property damage during strong windstorms by acting as an abrasive material agent (similar to sandblasting activities). Finally, fugitive dust can result in a nuisance factor due to the soiling of proximate structures and vehicles.

Diesel particulate matter is a mixture of many exhaust particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic, including 16 that are classified as possibly carcinogenic by the International Agency for Research on Cancer. Diesel particulate matter includes the particle-phase constituents in diesel exhaust. Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation and exposure can cause coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of ambient fugitive dust pollution as well, and numerous studies have linked elevated fugitive dust levels in the air to increased hospital admission, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems (OEHHA 2001) diesel particulate matter in the Basin poses the greatest cancer risk of all the toxic air pollutants.

3.3 Greenhouse Gas Emissions Overview

Parts of the earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The 'blanket' is a collection of atmospheric gases called GHGs based on the idea that the gases 'trap' heat similar to the glass walls of a greenhouse. These gases, mainly water vapor, carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons (CFCs), act as global insulators, reflecting visible light and infrared radiation back to the earth.

The participation of water vapor and ozone as GHGs is poorly understood. It is unclear the extent to which water vapor acts as a GHG. The uncertainty is due to the fact that water vapor can also produce cloud cover, which reflects sunlight away from the earth and can counteract its effect, if any, as a GHG. Also, water vapor tends to increase as the earth warms, so it is unclear whether an increase in water vapor is contributing to climate change or rather a reaction to climate change. Ozone tends to break down in the presence of solar radiation but the mechanism is not well understood. For these reasons methodologies approved by the Intergovernmental Panel on Climate Change (IPCC), EPA, and the California Air Resources Board (ARB) focus on carbon dioxide, methane, nitrous oxide, CFCs, and hydrofluorcarbons as GHGs. A brief description of each of these GHGs is provided below.

3.3.1 Greenhouse Gases

The following provides a brief description of the GHGs considered in the following analysis.

Carbon Dioxide (CO_2) enters the atmosphere through the burning of fossil fuels (e.g., oil, natural gas, and coal), solid waste, and trees and wood products, and as a result of other chemical reactions, such as those required to manufacture cement. Globally, the largest source of carbon dioxide emissions 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 carbon dioxide emissions. Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle. Natural sources of carbon dioxide that occur within the carbon cycle where billions of tons of atmospheric carbon dioxide are removed from the atmosphere by oceans and growing plants, also known as 'sinks,' and are emitted back into the atmosphere annually through natural processes, also known as 'sources.' When in balance, the total carbon dioxide emissions and removals from the entire carbon cycle are roughly equal. Since the Industrial Revolution in the 1700s, human activities, including burning of oil, coal and gas and deforestation, have increased carbon dioxide concentrations in the atmosphere. In 2005, global atmospheric concentrations of carbon dioxide were 35 percent higher than they were before the Industrial Revolution (EPA 2010b)

Methane (CH_4) is emitted from a variety of both human-related and natural sources. Human-related activities include fossil fuel production, animal husbandry, rice cultivation, biomass burning, and waste management. Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. It is estimated that 60 percent of global methane emissions are related to human-related activities. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources, such as wildfires. Methane emission levels from a particular source can vary significantly from one country or region to another, depending on many factors such as climate, industrial and agricultural production characteristics, energy types and usage, and waste management practices. For example, temperature and moisture have a significant effect on the anaerobic digestion process, which is one of the key biological processes that cause methane emissions in both human-related and natural sources. Also, the implementation of technologies to capture and utilize methane from sources such as landfills, coal mines, and manure management systems affects the emission levels from these sources (EPA 2010b).

Nitrous oxide (N_2O), more commonly known as "laughing gas," is produced naturally by microbial processes in soil and water. In addition to agricultural sources, some industrial processes, such as fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions, also contribute to its atmospheric load. It is used in rocket engines, racecars, and as an aerosol spray propellant. Global concentration of nitrous oxide in 1998 was 314 parts per billion (ppb) (EPA 2010b).

Chlorofluorocarbons (CFCs) have no natural source, but were synthesized for uses as refrigerants, aerosol propellants, and cleaning solvents. Since their creation in 1928, the concentrations of CFCs in the atmosphere have been rising. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and has successfully reduced or stopped the increase in the levels of the major CFCs. However, due to the long atmospheric lifetimes, CFCs will remain in the atmosphere for over 100 years. CFCs, Tetrafluoromethane (CF_4), sulfur hexafluoride (SF_6), and hydrofluorcarbons (HFCs) have been banned and are no longer commercially available. Therefore, they are not considered any further in this analysis.

Hydrofluorcarbons (HFCs) are another set of synthesized compounds. HFCs are also considered GHGs, though they are less stable in the atmosphere and therefore have a shorter lifetime and less of an impact than CFCs.

Global atmospheric concentrations of the above-mentioned GHGs have increased markedly as a result of human activities and now far exceed pre-industrial era values. The accumulation of GHGs in the atmosphere regulates the earth's temperature. The evidence is now considerable that anthropogenic GHG emissions, from electricity production, motor vehicle use, etc., have contributed to the elevated concentration of these gases in the atmosphere. The elevated concentration, in turn, is causing the earth's temperature to rise. A warmer earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans. GHG emissions from California are comprised of approximately 81 percent carbon dioxide from fossil fuel combustion; four percent carbon dioxide from process emissions; six percent from methane; and seven percent from nitrous oxide. The remaining two percent of GHG emissions in California are comprised of other GHGs.

As shown in Table 1, individual GHGs have varying global warming potentials (GWP) and atmospheric lifetimes. The CO_2e is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions into a consistent metric. The reference gas for GWP is carbon dioxide, with a GWP of 1. By comparison, methane's GWP is 23, since methane has a greater global warming effect than carbon dioxide on a molecule to molecule basis. One teragram ([Tg] equal to one million metric tons) of CO_2e is the mass of a project emissions of an individual GHG multiplied by the gas's GWP. The following discussion details the project's generation of total CO_2e emissions.

Table 1 Global Warming Potentials and Atmospheric Lifetimes of Common GHGs

GHG	Formula	100-year global warming potential[(1)]	Atmospheric lifetime (years)
Carbon dioxide	CO_2	1	Variable
Methane	CH_4	21	12 (± 3)
Nitrous oxide	N_2O	310	120
Sulphur hexafluoride	SF_6	23,900	3,200

(1) The warming effects over a 100-year time frame relative to other GHG.
Source: EPA 2009

3.3.2 Regional Adverse Effects of Climate Change

The increasing atmospheric concentration of GHGs resulting from human activities is changing the climate in ways that pose serious risks to health, economy, and environment. Potential consequences of climate change on the project site could include impacts on water resources, public health, electricity supplies, fire suppression resources, and vegetation.

Human Health

One of the biggest risks to the health of climate change is air pollution. Increased heat may increase ozone levels and air pollution toxicity, which may intensify respiratory cases and death attributed to asthma and pulmonary inflammation. Warmer temperatures could increase the opportunities for tick-borne Lyme disease and mosquito-borne diseases such as West Nile virus. Cases of dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat may also increase (EPA 2010d).

Ecosystems

The ecosystems that support the San Dimas area through water and food supplies, as well as the city's economy, will endure a variety of stresses associated with climate change. There is some uncertainty about exactly how changes in temperature and precipitation will impact the health of ecosystems, and how sensitive their interdependent systems are to any significant level of change (EPA 2010d).

Temperature

If GHGs continue to increase, climate models predict that the average temperature at the Earth's surface could increase from 3.2 to 7.2°F above 1990 levels by the end of this century (EPA 2010a). The average daily temperature for the City of San Dimas between 1906 and 2009 was 62.5°F (16.9°C). Given a seven degree increase, the average daily temperature could reach up to 69.7°F (20.9°C) by 2100.

Water Resources

Southern California is a semi-arid region and is largely dependent upon imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the state and western United States, make the city highly susceptible to water supply reliability issues. Primary water supplies from snow packs in the Sierra Nevada mountain range could be reduced by as much as 20 to 40 percent by 2100 (CEC 2009b). The city receives imported water from the Golden State Water Company, a subsidiary of the American States Water Company. The Golden State Water Company receives water from the State Water Project (SWP).

Fire Risk

The occurrence of wildfires could increase as much as 53 percent, especially in areas interfacing with natural vegetation (CEC 2009b). The city, including the project site, is bordered by hills, mountains, open space, and undeveloped lots contiguous to residential development, including the Angeles National Forest. Residential landscaping, fencing, and outbuildings increase fuel loading, spotting, and fire intensity.

Increased Frequency of Rolling Blackouts

A blackout refers to the total loss of power to an area. Blackouts come without warning, last for indeterminate periods, and are typically caused by catastrophic equipment failure, severe weather, or excessive power demands. Summer electricity shortages could occur as early as 2020, as southern California is considered particularly vulnerable (CEC 2009b). Worst case scenarios include rolling and/or total black outs. The nature, cause, and locality of the blackout determine who is affected. Outages may last from a few hours to a few weeks depending on the nature of the blackout and the configuration of the electrical network. Rolling blackouts are deliberate power cuts which are designed to reduce the load on an electricity generation system and the power grid. Rolling blackouts are a last resort measure used by an electricity provider in order to avoid a total blackout of the power system. They are usually in response to a situation where the demand for electricity exceeds the power supply capability of the network. Rolling blackouts may be localized to a specific part of the electricity network or may be more widespread and affect the entire city. Rolling blackouts typically last only a few hours.

Almost all modern activities depend on electricity. An electricity blackout causes impacts to every aspect of daily life, virtually bringing daily activities to a complete standstill. Electrical loss could affect daily commutes (no traffic signals or trains), elevator use, office functions (no light, computers, copiers,

or faxes), food preparation (no microwave, refrigerators, appliances, or solid state ignition), and communications (no television or radio.). Emergency services would be drastically affected. As electricity demand increases and sources decrease, cost will rise and affect our overall economy.

4.0 Air Quality and GHG Emissions Regulations

Air quality within the Basin is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies and regulations responsible for improving the air quality within the Basin are discussed below.

4.1 Federal

Clean Air Act

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the EPA to establish NAAQS with states retaining the option to adopt more stringent standards or to include other specific pollutants. On April 2, 2007, the Supreme Court found that GHGs, including carbon dioxide, are air pollutants covered by the CAA; however, no NAAQS have been established for GHGs.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those “sensitive receptors” most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Current NAAQS are listed in Table 2. Areas that meet the ambient air quality standards are classified as “attainment” areas while areas that do not meet these standards are classified as “non-attainment” areas. The classifications for ozone non-attainment include and range in magnitude from marginal, moderate, serious, severe, and extreme. The EPA classifies the Basin as in attainment for carbon monoxide and NO_2. The Basin is in non-attainment for PM_{10} and $PM_{2.5}$ and is in extreme non-attainment for ozone (8-hour). With this designation, the Basin must meet attainment of the 8-hour standard by 2024. Table 3 lists the attainment status of the Basin for the criteria pollutants.

The CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The SIP is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The EPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA.

Table 2 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]	Federal Standards [2]	
		Concentration	Primary [3, 4]	Secondary [3, 5]
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	Same as Primary Standards
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary Standards
	Annual Arithmetic Mean	20 µg/m	--	
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard	35 µg/m	Same as Primary Standards
	Annual Arithmetic Mean	12 µg/m	15 µg/m	
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1-hour	0.18 ppm (470 mg/m^3)	--	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	0.030 ppm (80 µg/m^3)	--
	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	--
	3 Hour	--	--	0.5 ppm (1300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	--	--
Lead[6]	30 Day Average	1.5 µg/m^3	--	--
	Calendar Quarter	--	1.5 µg/m^3	Same as Primary Standard
	Rolling 3-Month Average[7]	--	0.15 µg/m^3	
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more due to particles.	No Federal Standards	
Sulfates	24 Hour	25 µg/m^3	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	No Federal Standards	
Vinyl Chloride[6]	24 Hour	0.01 ppm (26 µg/m^3)	No Federal Standards	

(1) California standards for ozone, carbon monoxide, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride standards are not to be equaled or exceeded.

(2) National standards, other than 1-hour ozone, 8-hour ozone, 24-hour PM_{10}, 24-hour $PM_{2.5}$, and those based on annual averages, are not to be exceeded more than once a year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hour concentrations is below 0.08 ppm. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile 24-hour concentrations is below 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98th percentile 24-hour concentrations is below 65 µg/m^3.

(3) Concentration expressed first in units in which it was promulgated. Equivalent units given in parenthesis are based on a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar). All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury; parts per million (ppm) in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

(4) National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

(5) National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

(6) The ARB had identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

(7) National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: ARB 2010a.

Table 3 Attainment Status for the South Coast Air Basin

Pollutant	State Status	Federal Status
Ozone (1-hour)	Extreme Non-attainment	Note [1]
Ozone (8-hour)	Extreme Non-Attainment	Extreme non-attainment[2]
Respirable Particulate Matter (PM_{10})	Non-attainment	Serious non-attainment[2]
Fine Particulate Matter ($PM_{2.5}$)	Non-attainment	Non-attainment
Carbon Monoxide	Attainment	Attainment/Maintenance
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Maintenance
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead (Pb)	Attainment	Attainment

Note [1] The federal 1-hour ozone standard was revoked in 2005 and is no longer in effect for the state of California.

[2] Source: EPA 2010. Currently Designated Nonattainment Areas for All Criteria Pollutants. Last updated June 16, 2010. http://www.epa.gov/air/oaqps/greenbk/ancl.html#CALIFORNIA

Source: ARB 2010b

Final Mandatory Reporting of Greenhouse Gas Rule

In September 2009, the EPA issued the Final Mandatory Reporting of GHG Rule. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to EPA. The EPA estimates that the rule covers about 10,000 facilities nationwide, accounting for about 85 percent of United States GHG emissions.

4.2 State

California Clean Air Act

The California Clean Air Act (CCAA) allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. The ARB, a part of the California EPA (CalEPA) is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California ambient air quality standards (CAAQS). ARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. The ARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. The ARB also has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts.

In addition to standards set for the six criteria pollutants, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles (see Table 2). These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Further, in addition to primary and secondary AAQS, the state has established a set of episode criteria for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter. These criteria refer to

episode levels representing periods of short-term exposure to air pollutants that actually threaten public health.

The Basin is designated as attainment of the CAAQS for carbon monoxide, NO_2, SO_2, and lead. The Basin is in non-attainment status for PM_{10} and $PM_{2.5}$ and is designated as extreme non-attainment for ozone (1-hour and 8-hour).

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

1. By 2010, California shall reduce GHG emissions to 2000 levels;
2. By 2020, California shall reduce GHG emissions to 1990 levels; and
3. By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

The first California Climate Action Team (CAT) Report to the Governor in 2006 contained recommendations and strategies to help meet the targets in Executive Order S-3-05. The latest CAT Biennial Report was released in April, 2010. It expands on the policy oriented 2006 assessment. This report provides new information and scientific findings. The new information and details in the CAT Assessment Report include development of new climate and sea-level projections using new information and tools that have become available in the last two years; and evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts (CAT 2010). The action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by Executive Order S-13-08, described below.

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

In September 2006, the California State Legislature adopted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG emissions in California. GHGs as defined under AB 32 include carbon dioxide, methane, nitrous oxide, HFCs, perfluorocarbons, and sulfur hexafluoride. Under AB 32, the ARB has the primary responsibility for reducing GHG emissions and managing the CCAT to coordinate statewide efforts and promote strategies that can be undertaken by many other California agencies. AB 32 requires the ARB to adopt rules and regulations that would achieve GHG emissions equivalent to state-wide levels in 1990 by 2020. In general, AB 32 directs the ARB to do the following:

1. Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit;
2. Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020;
3. On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures;
4. On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and

non-monetary incentives that reduce GHG emissions from any sources or categories of sources that the ARB finds necessary to achieve the statewide GHG emissions limit; and

5. Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

Regarding the first two bullets, the ARB has already made available a list of discrete early action GHG emission reduction measures. The ARB has also published a staff report titled *California 1990 GHG Emissions Level and 2020 Emissions Limit* (ARB 2007a) that determined the statewide levels of GHG emissions in 1990. The ARB identified 427 MMT CO_2e as the total statewide aggregated GHG 1990 emissions level and 2020 emissions limit. Additionally, in December 2008, the ARB adopted the Climate Change Scoping Plan, which outlines the state's strategy to achieve the 2020 GHG limit. This Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. The plan emphasizes a cap-and-trade program, but also includes the discrete early actions.

Senate Bill 97

Senate Bill (SB) 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop draft State CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" by July 1, 2009 and directs the Resources Agency to certify and adopt the State CEQA Guidelines by January 1, 2010. OPR held two workshops to present the amendments and obtain input from the public. The workshops included an overview of the Preliminary Draft CEQA Guideline amendments, and the process for adopting the amendments. On December 30, 2009, the Natural Resources Agency certified and adopted the proposed CEQA Guidelines amendments. The amendments provide regulatory guidance with respect to the analysis and mitigation of the potential effects of GHG emissions.

Executive Order S-13-08

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08, the Climate Adaptation and Sea Level Rise Planning Directive, which provides clear direction for how the state should plan for future climate impacts. Executive Order S-13-08 calls for the implementation of four key actions to reduce the vulnerability of California to climate change:

1. Initiate California's first statewide Climate Change Adaptation Strategy (CAS) that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies;
2. Request that the National Academy of Sciences establish an expert panel to report on sea level rise impacts in California in order to inform state planning and development efforts;
3. Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new and existing projects; and
4. Initiate studies on critical infrastructure projects and land-use policies vulnerable to sea level rise.

The 2009 CAS report summarizes the best known science on climate change impacts in the state to assess vulnerability and outlines possible solutions that can be implemented within and across state agencies to promote resiliency. This is the first step in an ongoing, evolving process to reduce California's vulnerability to climate impacts (California Climate Change Portal 2010).

California Public Utility Commission

The California Public Utility Commission (CPUC) Energy Action Plan (2008 update) requires new residential buildings to be energy neutral by 2020 and commercial buildings to be energy neutral by 2030 to meet the AB 32 objectives. The mandate will require further reduction in energy usage related emissions which will reduce the project emissions overall. The goals are outlined in the CPUP California Long Term energy Efficiency Strategic Plan, adopted in September 2008.

California Code of Regulations Title 24, Part 6

Although it was not originally intended to reduce GHG emissions, California Code of Regulations (CCR) Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The Energy Commission adopted 2008 Standards on April 23, 2008 and the Building Standards Commission approved them for publication on September 11, 2008. The 2008 updates became effective on August 1, 2009. The Energy Commission adopted the 2008 changes to the Building Energy Efficiency Standards for several reasons:

1. To provide California with an adequate, reasonably priced, and environmentally sound supply of energy;
2. To respond to AB 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its GHG emissions to 1990 levels by 2020;
3. To pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs;
4. To act on the findings of California's Integrated Energy Policy Report (IEPR) that concludes that the Standards are the most cost effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Standards in reducing energy related to meeting California's water needs and in reducing GHG emissions;
5. To meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes; and
6. To meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.

Senate Bill 375

SB 375, approved by the governor on September 30, 2008, requires metropolitan planning organizations (MPOs) to include sustainable communities strategies (SCS), as defined, in their regional transportation plans (RTPs) for the purpose of reducing GHG emissions, aligns planning for transportation and housing, and creates specified incentives for the implementation of the strategies. Specifically, this bill makes findings and declarations concerning the need to make significant changes in land use and transportation policy in order to meet the GHG reduction goals established by AB 32. SB 375 also requires ARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035 by September 30, 2010. The 18 Metropolitan Planning Organizations in California will prepare a SCS to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the ability for the region to attain ARB's targets. Within eight years cities will be required to update housing plans required by the state.

The ARB Regional Targets Advisory Committee (RTAC), which was appointed in January 2009 to help address the requirements of Senate Bill (SB) 375, was tasked with recommending a method by which each major region of the state could reduce GHG emissions through more sustainable land use and transportation planning. After approximately 13 public meetings in Sacramento, the RTAC, in its September 29, 2009 report, recommended that regional targets be expressed as a percent per-capita GHG emission reduction from a 2005 base year. This differs from the 1990 base year established in AB 32 due to a lack of reliable regional transportation and land use data from 1990 (according to the RTAC). The RTAC also recommended ARB use an interactive process with the regional Metropolitan Planning Organizations, such as the Southern California Association of Governments (SCAG), to set a single statewide uniform target that could be adjusted up or down to respond to regional differences. The targets may be expressed in gross metric tons, metric tons per capita, metric tons per household, or in any other metric deemed appropriate by ARB, and are to be presented to the ARB Board by September 2010.

The City of San Dimas is located within the San Gabriel Valley subregion of the SCAG. The City of San Dimas is a member of the San Gabriel Valley Council of Governments (SGVCOG) and is monitoring the SCAG effort to prepare the SCS through active participation with SGVCOG. The current schedule calls for development of the SCS by the end of 2012.

4.3 Local

Air Quality Management Plan

The SCAQMD and SCAG are the agencies responsible for preparing the Air Quality Management Plan (AQMP) for the Basin. Since 1979, a number of AQMPs have been prepared. The 1997 AQMP, updated in 1999 and replaced in 2003, was based on the 1994 and 1991 AQMPs, and was designed to comply with state and federal requirements, reduce the high level of pollutant emissions in the Basin, and ensure clean air for the region through various control measures. To accomplish its task, the 1991 AQMP relied on a multilevel partnership of governmental agencies at the federal, state, regional, and local level. These agencies (i.e., the EPA, the ARB, local governments, SCAG, and SCAQMD) are the cornerstones that implement the AQMP programs.

The 2003 AQMP, adopted in August 2003, updated the attainment demonstration for the federal standards for ozone and PM_{10}; replaced the 1997 attainment demonstration for the federal carbon monoxide standard and provided a basis for a maintenance plan for carbon monoxide for the future; and updated the maintenance plan for the federal NO_2 standard that the Basin has met since 1992.

The most recent comprehensive plan is the 2007 AQMP adopted on July 13, 2007. The 2007 AQMP is designed to meet the state and federal CAA planning requirements and focuses on ozone and $PM_{2.5}$. The 2007 AQMP incorporates significant new emissions inventories, ambient measurements, scientific data, control strategies, and air quality modeling.

South Coast Air Quality Management District Greenhouse Gas Emissions Thresholds

The SCAQMD is in the process of creating CEQA significance thresholds for GHG emissions in the Basin. Currently, the SCAQMD staff is conducting ongoing meetings with a GHG CEQA Significance Threshold Working Group that includes representatives from various agencies and stakeholder groups such as ARB, city and county planning departments, and utility providers. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The staff's recommended interim GHG significance threshold uses a tiered approach to determining significance, based on a 90 percent emission capture rate for the basin. According to SCAQMD, a 90 percent emission capture rate means that 90 percent of total emissions from all new or modified stationary source projects would be subject to a CEQA analysis. The tiered approach envisioned by SCAQMD would require quantification of GHG emissions for all projects that are subject to CEQA and quantification of the GHG reduction effectiveness of design parameters incorporated into the project and any mitigation measures imposed by the lead agency.

Thresholds of GHG emissions for private development projects subject to CEQA within the Basin have not yet been adopted. However, SCAQMD has conducted research to determine the 90 percent emission capture rate for the air basin. SCAQMD surveyed 711 projects from the Office of Planning and Research to determine the 90 percent emission capture rate for residential, commercial, and mixed-use projects. In November 2009, members of the GHG CEQA Significance Threshold Working Group identified a potential significance threshold of 3,000 tons per year of CO_2e for residential, commercial, and mixed-use projects, plus an undetermined percentage exceedance of Title 24 (energy usage reduction) standards.

South Coast Air Quality Management District Rule 403 – Fugitive Dust

During construction, projects within the Basin are subject to SCAQMD Rule 403 (fugitive dust). SCAQMD Rule 403 does not require a permit for construction activities, but sets forth general and specific requirements for all construction sites (as well as other fugitive dust sources) in the Basin. The general requirement prohibits a person from causing or allowing emissions of fugitive dust from construction (or other fugitive dust source) such that the presence of such dust remains visible in the atmosphere beyond the property line of the emissions source. SCAQMD Rule 403 also prohibits a construction site from causing an incremental PM_{10} concentration impact at the property line of more than 50 micrograms per cubic meter ($\mu g/m^3$) as determined through PM_{10} high-volume sampling, but the concentration standard and associated PM_{10} sampling do not apply if specific measures identified in the rules are implemented and appropriately documented.

In accordance with Rule 403, the SCAQMD requires that contractors implement Best Available Control Technology (BACT) for construction activities. These requirements are identified in Table 4. Note that these measures are regulatory requirements and as such, do not constitute mitigation under CEQA.

The conditions included in Table 4 apply to construction activities conducted during normal wind conditions (i.e., with wind gusts less than 25 miles per hour). Additional contingency measures, included in Table 5, are applied to those periods when instantaneous wind gusts meet or exceed 25 miles per hour.

City of San Dimas General Plan 2008-2014 Housing Element

The City of San Dimas encourages green building in Section IV of the 2008-2014 Housing Element, Housing Resources (City of San Dimas 2008). This chapter describes and analyzes resources available for the development, rehabilitation, and preservation of housing within the City of San Dimas. Section IV.D, *Opportunities for Energy Conservation*, provides an overview of energy conservation and green building resources available to the City and its residents to reduce the impact of conventional building construction and use, demolition, and manufacturing of building materials on the environment. Impacts identified in the plan include electricity consumption, GHG emissions, raw materials use, landfill waste, and potable water consumption. The Housing Element states that one of the primary goals behind establishing a green building program is to create a holistic, integrated design approach to building that considers a broad range of issues including community and site design, energy efficiency, water conservation, resource-efficient material selection, indoor environmental quality, construction management, and building maintenance. The following ways in which San Dimas promotes energy conservation are identified in the Housing Element:

1. Advertise utility rebate programs and energy audits available through Edison and Southern California Gas, particularly connected to housing rehabilitation programs. Lower-income households are also eligible for State sponsored energy and weatherization programs.
2. Develop green (energy-efficient and environmentally-sensitive) building standards for public buildings.
3. Provide incentives, such as expedited plan check, for private developments that are building green.
4. Support the elimination of contamination in older buildings (lead-based paint, asbestos, etc.) during rehabilitation and code inspections.
5. Allow higher densities and mixed use development within walking distance of commercial development, thereby reducing vehicular trips and reducing GHG emissions.
6. Promote funding opportunities for private green buildings, including available rebates and funding available through the California Energy Commission for installation of solar panels.
7. Provide resource materials and training opportunities regarding green building and energy conservation.
8. Apply green building criteria to rehabilitation of single- and multi-family buildings.

The City of San Dimas is considering integrating sustainability guidelines into the Land Use, Conservation, and Circulation Elements of the next General Plan Update; however, an updated General Plan has not yet been adopted and no drafts have been made available for review.

Table 4 Required Best Available Control Measures for Fugitive Dust (Applicable to All Construction Activity Sources)

Source Category	Control Measures[1]	Guidance[2]
Backfilling	Stabilize backfill material when not actively handling; stabilize backfill material during handling; and stabilize soil at completion of activity	Mix backfill soil with water prior to moving; dedicate water truck or high capacity hose to backfilling equipment; empty loader bucket slowly so that no dust plumes are generated; and minimize drop height from loader bucket.
Clearing and grubbing	Maintain stability of soil through pre-watering of site prior to clearing and grubbing; stabilize soil during clearing and grubbing activities; and stabilize soil immediately after clearing and grubbing activities.	Maintain live perennial vegetation where possible; and apply water in sufficient quantity to prevent generation of dust plumes.
Clearing forms	Use water spray to clear forms; use sweeping and water spray to clear forms; or use vacuum system to clear forms.	Use of high pressure air to clear forms may cause exceedance of Rule requirements.
Crushing	Stabilize surface soils prior to operation of support equipment; and stabilize material after crushing.	Follow permit conditions for crushing equipment; pre-water material prior to loading into crusher; monitor crusher emissions opacity; and apply water to crushed material to prevent dust plumes.
Cut and fill	Pre-water soils prior to cut and fill activities; and stabilize soil during and after cut and fill activities.	For large sites, pre-water with sprinklers or water trucks and allow time for penetration; and use water trucks/pulls to water soils to depth of cut prior to subsequent cuts.
Demolition – mechanical/ manual	Stabilize wind erodible surfaces to reduce dust; stabilize surface soil where support equipment and vehicles will operate; stabilize loose soil and demolition debris; comply with AQMD Rule 1403.	Apply water in sufficient quantities to prevent the generation of visible dust plumes.
Disturbed soil	Stabilize disturbed soil throughout the construction site; and stabilize disturbed soil between structures	Limit vehicular traffic and disturbances on soils where possible; if interior block walls are planned, install as early as possible; and apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes.
Earth-moving activities	Pre-apply water to depth of proposed cuts; re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and stabilize soils once earth-moving activities are complete.	Grade each Project phase separately, timed to coincide with construction phase; upwind fencing can prevent material movement on site; and apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes.
Importing/ exporting of bulk materials	Stabilize material while loading to reduce fugitive dust emissions; maintain at least six inches of freeboard on haul vehicles; stabilize material while transporting to reduce fugitive dust emissions; stabilize material while unloading to reduce fugitive dust; and comply with Vehicle Code Section 23114.	Use tarps or other suitable enclosures on haul trucks; check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage; comply with track-out prevention/mitigation requirements; and provide water while loading and unloading to reduce visible dust plumes.
Landscaping	Stabilize soils, materials, slopes	Apply water to materials to stabilize; maintain materials in a crusted condition; maintain effective cover over materials; stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes; and Hydro seed prior to rain season.

Table 4. Continued

Source Category	Control Measures[1]	Guidance[2]
Road shoulder maintenance	Apply water to unpaved shoulders prior to clearing; and apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs; and use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs.
Screening	Pre-water material prior to screening; limit fugitive dust emissions to opacity and plume length standards; and stabilize material immediately after screening.	Dedicate water truck or high capacity hose to screening operation; drop material through the screen slowly and minimize drop height; and install wind barrier with a porosity of no more than 50 percent upwind of screen to the height of the drop point.
Staging areas	Stabilize staging areas during use; and stabilize staging area soils at project completion.	Limit size of staging area; limit vehicle speeds to 15 miles per hour; and limit number and size of staging area entrances/exits.
Stockpiles/bulk material handling	Stabilize stockpiled materials, and stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	Add or remove material from the downwind portion of the storage pile; and maintain storage piles to avoid steep sides or faces.
Traffic areas for construction activities	Stabilize all off-road traffic and parking areas; stabilize all haul routes; and direct construction traffic over established haul routes.	Apply gravel/paving to all haul routes as soon as possible to all future roadway areas; and barriers can be used to ensure vehicles are used only on established parking areas/haul routes.
Trenching	Stabilize surface soils where trencher or excavator and support equipment will operate; and stabilize soils at the completion of trenching activities.	Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches, soak soils via the pre-trench, and resume trenching; and washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment.
Truck loading	Pre-water material prior to loading; and ensure that freeboard exceeds six inches (CVC 23114)	Empty loader bucket such that no visible dust plumes are created; and ensure that the loader bucket is close to the truck to minimize drop height while loading.
Turf overseeding	Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and cover haul vehicles prior to exiting the site.	Haul waste material immediately off site.
Unpaved roads/parking lots	Stabilize soils to meet the applicable performance standards; and limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements.
Vacant land	In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees, or other effective control measures.	

(1) Control Measures are required actions.
(2) Guidance are suggestions on how to accomplish the control measures.
Source: SCAQMD 2004

Table 5 Contingency Control Measures for Fugitive Dust During High Winds[1]

Source Category	Control Measures
Earth-moving	Cease all active operations; or apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; apply chemical stabilizers prior to wind event; or apply water to all unstabilized disturbed areas three times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; or establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or utilize any combination of these control actions such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	Apply chemical stabilizers prior to wind event; apply water twice per hour during active operation; or stop all vehicular traffic.
Open storage piles	Apply water twice per hour; or install temporary coverings.
Paved road track-out	Cover all haul vehicles; or comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All categories	Any other control measures approved by the Executive Officer and the EPA as equivalent to the methods specified in this table may be used.

[1] Winds exceeding 25 miles per hour.
Source: SCAQMD 2004

5.0 Existing Air Quality

Criteria Air Pollutants

Existing levels of ambient air quality and historical trends and projections in the project area are best documented by measurements made by the SCAQMD. The project area is located within Source/Receptor Area (SRA) 10, Pomona/Walnut Valley. No data was available for PM_{10} or $PM_{2.5}$ in SRA 10; therefore, data from monitoring station SRA 9, located in East San Gabriel County, was used for these pollutants. Data from monitoring stations in SRAs 9 and 10 are summarized in Table 6.

Ozone pollution generally increased between 2006 and 2008, with 47 days experiencing a violation of the state 8-hour standard. The data show recurring violations of both the state and federal ozone standards in 2007 and 2008, but no violations in 2006. The data also indicate that the area exceeds the PM_{10} state standards and $PM_{2.5}$ federal standards. The carbon monoxide and NO_2 standards have not been violated in the last three years in SRA 10.

Greenhouse Gas Emissions

At the August 25, 2009 City Council meeting, the San Dimas City Council voted to prepare an Energy Strategy and Greenhouse Gas Emissions Inventory (City of San Dimas 2009). The inventory has been prepared and was published on June 1, 2010. The inventory represents the City's calculated emissions for the baseline year 2006 generated by activities associated with the City of San Dimas. A projected 2020 "business-as-usual" inventory assumed that any projected growth in the City would occur at the same carbon intensities as in 2006. Total emissions associated with activities occurring in the City in 2006 were 305,893 metric tons of CO_2e (MT CO_2e), or 8.55 MT CO_2e per capita. The largest contributing

source was transportation emissions, which made up 52 percent of total emissions (159,007 MT CO_2e). Residential and non-residential emissions were the next largest contributors, at 19 percent and 18 percent respectively. Solid waste contributed eight percent, operation of City infrastructure contributed two percent, and energy usage related to water transfer outside the City was the smallest contributor at one percent. Business-as-usual emissions in 2020 are projected to be 317,274 MT CO_2e, or 8.21 MT CO_2e per capita. The City is considered built-out, so limited development was projected to occur between 2006 and 2020. The population is anticipated to grow more than development. Since the population would grow faster than emissions would increase, the emissions are divided up between more people and the per capita emissions would decrease (Garcia 2010). With statewide and federal actions, including full implementation of the Renewable Portfolio Standards, Corporate Average Fuel Economy Standards, Low Carbon Fuel Standards, and Title 24 Code cycle updates, emissions in 2020 are projected to be 252,838 MT CO_2e, or 6.54 MT CO_2e per capita. Transportation would continue to be the largest source of GHG emissions (51 percent) under both the business-as-usual 2020 projection and the 2020 projection with implementation of statewide and federal actions.

Table 6 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Standards Were Exceeded and Maximum Levels During Such Violations					
	2006		2007		2008	
Ozone – SRA 10						
State 1-hour ≥ 0.09 ppm	0	days	19	days	32	days
State 8-hour ≥ 0.07 ppm	0	days	25	days	47	days
Federal 8-hour > 0.08 ppm	0	days	10	days	35	days
Maximum 1-hour concentration. (ppm)	0.06	ppm	0.153	ppm	0.141	ppm
Maximum 8-hour concentration (ppm)	0.040	ppm	0.108	ppm	0.110	ppm
Carbon Monoxide – SRA 10						
State 8-hour > 9.0 ppm	0	days	0	days	0	days
Federal 8-hour ≥ 9.5 ppm	0	days	0	days	0	days
Maximum 1-hour concentration (ppm)	3	ppm	3	ppm	3	ppm
Maximum 8-hour concentration (ppm)	1.88	ppm	2.0	ppm	2.0	ppm
Nitrogen Dioxide – SRA 10						
State 1-hour ≥ 0.25 ppm	0	days	0	days	0	days
Maximum 1-hour concentration (ppm)	0.09	ppm	0.10	ppm	0.11	ppm
Maximum Annual concentration (ppm)	--	ppm	0.0318	ppm	0.0302	ppm
Respirable Particulates (PM_{10}) – SRA 9						
State 24-hour > 50 $\mu g/m^3$	0	days	11	days	13	days
Federal 24-hour > 150 $\mu g/m^3$	0	days	0	days	0	days
Maximum 24-hour concentration ($\mu g/m^3$)	49	$\mu g/m^3$	83	$\mu g/m^3$	98	$\mu g/m^3$
Maximum Annual concentration ($\mu g/m^3$)	--	$\mu g/m^3$	35.6	$\mu g/m^3$	35.3	$\mu g/m^3$
Fine Particulates ($PM_{2.5}$) – SRA 9						
Federal 24-hour > 35 $\mu g/m^3$	3	days	19	days	5	days
Maximum 24-hour concentration ($\mu g/m^3$)	52.8	$\mu g/m^3$	63.8	$\mu g/m^3$	34.8	$\mu g/m^3$
Maximum Annual concentration ($\mu g/m^3$)	--	$\mu g/m^3$	15.9	$\mu g/m^3$	14.1	$\mu g/m^3$

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; SRA = Source/Receptor Area
Source: SCAQMD 2010a

The SCAQMD has not completed a GHG emission inventory for the Basin or any SRA. The ARB determines annual GHG emissions for the state of California (ARB 2010c). In 2008, the total gross GHG emissions in California totaled 478 million MT CO_2e. The greatest contributor to the GHG emissions was transportation, which resulted in 175 million MT CO_2e, or 37 percent of total emissions.

6.0 Project Impacts and Mitigation

The impact analysis contained in this report for criteria pollutants was prepared in accordance with the methodologies provided by the SCAQMD as included in its CEQA Air Quality Handbook (Handbook) (SCAQMD 1993). Regional impacts for both construction and operation are assessed using the Urban Emissions Model (URBEMIS 2007, version 9.2.4) distributed by the ARB. The URBEMIS 2007 model uses EMFAC 2007 emissions factors for vehicle traffic and Off-Road 2007 for construction equipment. The calculated emissions of the project are compared to the SCAQMD thresholds of significance for criteria pollutants for individual projects using the SCAQMD thresholds of significance published on the SCAQMD Website (SCAQMD 2010b). For GHG emissions, the impact analysis contained in this report was based on Appendix G of the CEQA guidelines. GHG emissions were calculated using the URBEMIS 2007 model and methodologies recommended by the California Climate Action Registry, US EPA, and Navigant Consulting. The project's GHG emissions and GHG–reducing features were compared to the goals of AB 32 to determine the project's significance.

6.1 Consistency with Regional Plans

Thresholds of Significance

Based on Appendix G of the CEQA Guidelines and the SCAQMD Handbook, an impact would be considered significant if implementation of the proposed project would result in a conflict with, or obstruct implementation of, the 2007 AQMP.

Impact Analysis

The determination of whether the project would conflict with the applicable AQMP is based on regional population projections. The 2007 AQMP relies on population projections from SCAG, which are based on Department of Finance (DOF) projections, as well as other factors, to determine growth in the Basin and related vehicular transportation patterns. The SCAG includes six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura. Therefore, SCAG projections include the entire Basin. The AQMP relies on information from the ARB and SCAG to predict future criteria pollutants, including mobile and area source emissions which in turn are based on the population projections. The population estimates used to determine future emissions in the 2007 AQMP are shown in Table 7. As shown in this table, the population of the SCAG region is projected to reach 19.6 million persons by 2030. Table 7 also shows the population projections for San Dimas. San Dimas consistently accounts for less than one percent (between 0.2 and 0.25 percent) of the regional population.

The project proposes the development of 61 new homes within San Dimas. Based upon the current persons-per-household ratio of 2.78 in the city (City of San Dimas 2008), the project would increase the population by approximately 170 persons. The resulting incremental increase in the city's population (to 40,215 persons) would still represent less than one percent of the SCAG population projections for the

region, and would therefore be accommodated within the growth accounted for in the AQMP. Implementation of the proposed project would not conflict with, or obstruct implementation of the AQMP. Therefore, the impact would be less than significant.

Table 7 Comparison between Regional and City of San Dimas Population Estimates

Year	SCAG Regional Population[1]	City of San Dimas	
		Population	Percent of SCAG Regional Population
1990	13,000,000	32,397[2]	0.25
2000	14,800,000	34,980[2]	0.24
2010	16,900,000	36,946[3]	0.22
2020	18,400,000	40,045[4]	0.22
2030	19,600,000	41,046[4][5]	0.21

Sources:
(1) SCAQMD 2007
(2) City of San Dimas 2008
(3) California Department of Finance 2010
(4) City of San Dimas 2004
(5) The Natural Hazard Mitigation Plan (City of San Dimas 2004) projects the population of San Dimas to reach 40,045 by 2020 and 42,047 by 2040. Therefore, for the purposes of this analysis, it is assumed that 50 percent of the projected growth in the city between 2020 and 2040 would occur by 2030.

Mitigation Measures

Implementation of the project would not conflict with, or obstruct implementation of applicable air quality plans; therefore, no mitigation measures are required.

6.2 Conformance to Federal and State Ambient Air Quality Standards

Thresholds of Significance

Based on Appendix G of the CEQA Guidelines and the SCAQMD Handbook, an impact would be considered significant if the proposed project would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

In order to assess whether or not a proposed project would cause a significant effect on the environment, the impact of the project must be analyzed by examining the types and levels of emissions generated and their impacts on factors that affect air quality. The SCAQMD has established air pollution thresholds against which a proposed project can be evaluated, thereby assisting lead agencies in determining whether or not implementation of the proposed project would result in a significant impact to air quality. If the thresholds are exceeded by a proposed project, then the impact is considered significant.

While the final determination of significance thresholds is within the purview of the lead agency, pursuant to the CEQA Guidelines, the SCAQMD recommends that the following air pollution thresholds

be used by lead agencies in determining whether impacts to air quality during the construction or operational phase of a proposed project are significant. If the lead agency finds that the proposed project has the potential to exceed any of the air pollution thresholds, impacts resulting from implementation of the proposed project would be considered significant. Table 8 lists the significance thresholds for air quality that have been established by the SCAQMD for construction and operational emissions.

Table 8 SCAQMD Thresholds of Significance

Pollutant	Construction Emissions (pounds/day)	Operation Emissions (pounds/day)
Reactive organic gases	75	55
Nitrogen oxides (NO_x)	100	55
Carbon Monoxide (CO)	550	550
Respirable Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55
Sulfur Oxides (SO_x)	150	150

Source: SCAQMD 2009a

Impact Analysis

Construction

Air pollutant emission sources during project construction would include exhaust and particulate emissions generated from construction equipment; fugitive dust from soil disturbance during site preparation, grading, and excavation activities; and volatile compounds that evaporate during site paving and painting of the structures. The project site is approximately 273 acres; however, only 90 acres of the site would be disturbed during construction. Residences would vary in size from 4,000 square feet to 15,000 square feet, with an average size of 5,000 to 6,000 square feet. Based on the average lot sizes, for this analysis it is assumed that 59 homes would be 6,000 square feet in size, and two homes would be 15,000 square feet in size. Construction would take approximately 5.25 years to complete. The proposed project construction phases include demolition of existing structures, mass grading, trenching for utilities, paving, building construction, and exterior architectural coating, as shown in Table 9. It is assumed that the demolition, grading, trenching, paving, and building construction phases would occur consecutively, with no overlap. The building construction and architectural coating phases are assumed to overlap because some buildings would be completed and occupied while other homes are being constructed. The demolition phase assumes that 100,000 cubic feet of demolition would be required to demolish the existing caretaker's quarters, stable, and barn. Grading would occur over a six month period, with a total of 132 working days. This analysis assumes that a limit of five acres per day would be disturbed and/or graded. A total of 1.3 million cubic yards would be graded and replaced on site. To balance the material on site, graded material would be moved throughout the site and the same material may be graded more than once. Therefore, it is assumed that a maximum of five percent, or 65,000 cubic yards, of , material would be graded each day. All cut material would be used on site and no hauling of material off site would be required. Approximately three months would be required for installation of the utilities; the first month of utility construction is assumed to be the trenching phase of construction. Roadway widths would vary

between 20 and 26 feet. To be conservative, and to account for the widened ends of cul-de-sacs and emergency turn-around areas, it is assumed that all proposed roadways on the project site would be 26 feet wide. Paving would be required for approximately 9.5 acres and would be accomplished in approximately three months. Because the residential units on the project site would be developed by multiple developers, and many are anticipated to be custom-built residences, the building phase of construction is estimated to last approximately 54 months, or 4.5 years. Based on information provided by the applicant, the analysis assumes a maximum of 95 daily trips would be generated by construction workers, or approximately 1.6 trips per residential unit per day. It is assumed that the architectural coating phase would occur simultaneously with the building construction phase; therefore, the coating phase would also last approximately 4.5 years. With the exception of the assumptions discussed above, URBEMIS2007 default values are used to calculate the proposed project's construction emissions. The URBEMIS2007 model does not take into account the additional construction standards adopted by the ARB after 2007. For example, beginning in 2008, heavy-duty diesel engines were required to be shut down when idling more than five minutes at any location within California. Therefore, the analysis provided above is conservative and actual project emissions may be less than calculated by the URBEMIS2007 model.

Table 9 Approximate Duration of Project Construction Phases

Construction Phase	Duration
Demolition	1 month
Mass Grading	6 months
Trenching	1 month
Paving	3 months
Building Construction and Coating	54 months
Total Construction Duration	**63 months**

Source: URBEMIS 2007. See Appendix A for data sheets.

Table 10 summarizes the maximum daily emissions of demolition, grading (assuming a maximum of five acres per day), paving, construction, and coating in comparison with the SCAQMD regional thresholds of significance. As shown in Table 10, project related emissions would be below the significance threshold in all construction phases except for the grading phase. Construction of the proposed project would exceed the significant thresholds for NO_x, PM_{10}, and $PM_{2.5}$ during grading. Impacts to air quality resulting from the grading phase of construction would be potentially significant.

Operational

Emissions related to the operation of the proposed project were calculated using the URBEMIS 2007 computer model. The major source of long-term operational air quality impacts from the proposed project would be emissions produced from project-generated vehicle trips. Vehicle trip generation is based on the proposed project traffic study, which was provided by Urban Crossroads (2010a). Pollutant emissions from vehicles were calculated using the standard assumptions and EMFAC 2007 emission factors that are used in URBEMIS2007, as recommend by the SCAQMD (SCAQMD 2009c).

Table 10 Construction Maximum Daily Emissions

Construction Phase	Pollutant Emissions (pounds/day)					
	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
Demolition	5	7	1	0	1	1
Mass Grading[(1)]	60	**141**	16	0	**7,725**	**1,617**
Trenching	9	15	2	0	1	1
Paving	10	15	3	0	1	1
Sum of Building Construction and Coating Phases	31	17	6	0	1	1
Building Construction	*31*	*17*	*4*	*0*	*1*	*1*
Coating	*0*	*0*	*2*	*0*	*0*	*0*
SCAQMD Threshold	**550**	**100**	**75**	**150**	**150**	**55**
Significant Impact?	No	**Yes**	No	No	**Yes**	**Yes**

[(1)] Assuming a maximum land disturbance of five acres per day.
Bold = Exceeds SCAQMD threshold
CO = carbon monoxide; NO_x = nitrogen oxides; ROG = reactive organic gases; SO_x = sulfur oxides
PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Source: URBEMIS 2007. See Appendix A for data sheets.

In addition to vehicle trips, the proposed project would produce emissions from on-site area sources. Area sources of emissions associated with the project include natural gas combustion emissions from space and water heating, emissions from the use of fuel combustion emissions from landscape maintenance equipment, emissions from energy use of consumer products, and ROG emissions from periodic repainting of interior and exterior surfaces.

The vehicular and area source emissions associated with operation of the proposed project are summarized in Table 11. As shown in this table, the proposed project would not exceed any of the daily regional thresholds during operation. Therefore, impacts to air quality resulting from operation would be less than significant.

Table 11 Operational Maximum Daily Emissions

Emissions Source	Pollutant Emissions (pounds/ day)					
	CO	NO_x	ROG	SO_x	PM_{10}	$PM_{2.5}$
Vehicular Sources	58	6	5	0	11	2
Area Sources						
Natural Gas	1	1	0	0	0	0
Landscape	4	0	1	0	0	0
Consumer Products	0	0	3	0	0	0
Architectural Coatings	0	0	0	0	0	0
Total Emissions	**63**	**7**	**9**	**0**	**11**	**2**
SCAQMD Thresholds	**550**	**55**	**55**	**150**	**150**	**55**
Significant Impact?	No	No	No	No	No	No

CO = carbon monoxide; NO_x = nitrogen oxides; ROG = reactive organic gases; SO_x = sulfur oxides
PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Source: URBEMIS 2007. See Appendix A for data sheets.

Mitigation Measures

The following mitigation measures would reduce impacts related to emissions of NO_x, PM_{10}, and $PM_{2.5}$ during the mass grading phase of construction. The proposed project would not exceed the SCAQMD thresholds during any other phase of construction, or during operation; therefore, no mitigation measures are required for the other phases of construction or operational emissions. Implementation of mitigation measures AQ-1 and AQ-2 during the mass grading phase of construction of the proposed project would minimize emissions of NO_x, PM_{10}, and $PM_{2.5}$ during grading.

AQ-1 **Construction Best Management Practices**. During all grading activities for the proposed project, the project applicant will ensure implementation of the following best management practices (BMPs) to reduce the emissions of NO_x and fugitive dust (PM_{10} to $PM_{2.5}$). Prior to issuance of a grading permit, the City Engineer will verify that these BMPs are specified on the grading plan.

i. All grading equipment will be EPA rated Tier 2 or above, will use aqueous diesel fuel, and will be fitted with a diesel oxidation catalyst that reduces emissions of NO_x by at least 20 percent.

ii. All exposed soil areas will be watered a minimum of three times per day, or as allowed under any imposed drought restrictions. On windy days or when fugitive dust can be observed leaving the construction site, additional water will be applied at a frequency to be determined by the on-site construction superintendent.

iii. Graded areas on slopes will be provided with temporary hydroseeding and cleared vegetation and graded slopes will be irrigated as soon as possible following grading activities in areas that will remain in disturbed condition (but will not be subject to further construction activities) for a period greater than five days during the construction phase.

iv. All transported material will be securely covered to prevent fugitive dust.

v. All vehicles on the construction site will be operated at speeds less than 15 miles per hour.

vi. All non-paved haul roads will be watered at least three times per day.

vii. All stockpiles that will not be utilized within three days will be covered with plastic or equivalent material, to be determined by the on-site construction contractor, or they will be sprayed with a non-toxic chemical stabilizer.

viii. Soil stabilizers will be applied to any disturbed area that is to remain inactive for more than five consecutive days. For prolonged periods of inactivity, re-application of soil stabilizer will be conducted as appropriate to eliminate visible dust from leaving the site.

ix. Ground cover in disturbed areas will be replaced within 30 days of the completion of construction activities. Dust suppression will be required for all disturbed areas where ground cover has not yet been re-established.

x. All soils/debris/fill materials being loaded or unloaded at the site will be watered down sufficiently within fifteen minutes of its loading/unloading. The materials will be

saturated to the point where no visible dust plumes are generated during loading/unloading activities.

AQ-2 **Paved Haul Roads**. During all grading activities for the Brasada Residential project, the on-site construction superintendent will ensure that no unpaved haul roads are utilized on the project site. All unpaved haul roads will be paved prior to use.

Significance after Mitigation

Table 12 summarizes the construction related emissions of this project with implementation of mitigation measures AQ-1 and AQ-2. Implementation of mitigation measures AQ-1 and AQ-2 would reduce emissions of NO_x, PM_{10}, and $PM_{2.5}$, to a less than significant level, as shown in Table 12. However, mitigation measure AQ-2, which requires paving all haul roads, is not feasible for this project because grading would occur throughout the site for the duration of the grading period, and, in order to balance cut and fill on the project site, graded material would be moved to various locations on the project site. Haul roads would have to be paved to move material, then unpaved again to continue grading or to begin construction. Paving and demolishing the pavement on the project site would result in additional air quality impacts. Therefore, mitigation measure AQ-2B would not be implemented. Only mitigation measure AQ-2A would be implemented to reduce emissions of NO_x, PM_{10}, and $PM_{2.5}$ during grading. As shown in this table, implementation of mitigation measure AQ-1 alone would reduce NO_x emissions to a level below the significance threshold. This impact would be less than significant. Emissions of PM_{10} and $PM_{2.5}$ would be reduced, but would still exceed the significance thresholds. Therefore, impacts related to emissions of PM_{10} and $PM_{2.5}$ would be significant and unavoidable.

Table 12 Mitigated Construction Daily Maximum Emissions (pounds/day)

Source	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
Implementation of Mitigation Measure AQ-1 and AQ-1						
Mass Grading[(1)]	60	96	16	0	123	27
SCAQMD Threshold	550	100	75	150	150	55
Significant Impact?	No	No	No	No	No	No
Implementation of Mitigation Measure AQ-1 Only						
Mass Grading[(1)]	60	96	16	0	**468**	**99**
SCAQMD Threshold	550	100	75	150	150	55
Significant Impact?	No	No	No	No	**Yes**	**Yes**

[(1)] Assuming a maximum land disturbance of five acres per day.
Bold = significant impact
CO = carbon monoxide; NO_x = nitrogen oxides; ROG = reactive organic gases; SO_x = sulfur oxides;
PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter;
Source: URBEMIS 2007

6.3 Impacts to Sensitive Receptors

ARB defines sensitive receptors as residences, schools, day care centers, playgrounds, and medical facilities, or other facilities that may house individuals with health conditions that would be adversely

affected by changes in air quality. The two primary emissions of concern regarding health effects for land development are carbon monoxide and diesel particulates.

Thresholds of Significance

Based on Appendix G of the CEQA Guidelines and the SCAQMD Handbook, a project would result in a potentially significant impact if it would expose sensitive receptors to substantial pollutant concentrations.

Carbon Monoxide Hotspots

Areas with high vehicle density, such as congested intersections and parking garages, have the potential to create high concentrations of carbon monoxide, known as carbon monoxide "hot spots." An air quality impact is considered significant if carbon monoxide emissions create a hot spot where either the California 1-hour standard of 20 ppm or the federal and state 8-hour standard of 9.0 ppm is exceeded.

Localized Sensitive Receptors

In addition to the regional daily threshold levels presented in Table 8, the SCAQMD has established the following look-up tables for each SRA that can be used to determine whether or not a project may generate significant adverse localized air quality impacts. The allowable emissions for SRA 10 from construction activities with a maximum disturbance of five acres per day are listed in Table 13, below. The localized thresholds indicate the amount of pollutant emissions from a construction site that would not disperse to below a significant level at a sensitive receptor at a given distance away. The thresholds become less stringent for receptors located farther from a construction site because fewer emissions from the construction site would reach the sensitive receptor, due to dispersion of the pollutants. For example, based on the thresholds in Table 13, emissions of 2,000 pounds per day of carbon monoxide during construction would not disperse to below an acceptable level at a receptor 25 meters (80 feet) away, but would disperse to below an acceptable level at receptors located 50 (160 feet) meters or more from the project site.

Table 13 Daily Localized Construction Thresholds for Source Receptor Area 10

	Pollutant Emissions (pounds per day)			
Distance of Receptor from Emissions Source	**CO**	**NO_2**	**PM_{10}**	**$PM_{2.5}$**
25 meters (80 feet)	1,566	236	12	7
50 meters (160 feet)	2,158	265	36	9
100 meters (330 feet)	3,691	330	51	15
200 meters (660 feet)	7,011	426	82	28
500 meters (1,640 feet)	23,450	681	175	93

CO = carbon monoxide; NO_2 = nitrogen dioxide; PM_{10} = respirable particulate matter;
$PM_{2.5}$ = fine particulate matter
Source: SCAQMD 2009b.

The localized sensitive receptor analysis for operation only applies to projects smaller than five acres. Following construction, operation of the proposed project would include a total of 90 acres; therefore, no localized sensitive receptors analysis was conducted for operation of the proposed project. The

regional significance thresholds listed in Table 8 are the only applicable thresholds for a project this size. However, it is assumed that five acres would be graded per day during project construction. Therefore, the thresholds listed in Table 13 are applicable to the construction of the proposed project. If more than five acres would be graded, the localized thresholds would no longer apply to project construction; the regional thresholds listed in Table 8 would be the only applicable thresholds. The project's regional air quality impacts are analyzed in Section 6.2, Conformance to Federal and State Ambient Air Quality Standards.

Toxic Air Contaminants

The ARB recommends distances for siting new sensitive land uses away from sources of TAC emissions in Table 1-1 of the Air Quality and Land Use Handbook (ARB 2005). The relevant sources of TAC emissions are freeways and high-traffic roads. The ARB recommends siting new sensitive land uses more than 500 feet away from freeways and high-traffic roads.

Impact Analysis

Carbon Monoxide Hotspots

Carbon monoxide is the criteria pollutant that is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere. Long-term adherence to ambient air quality standards is typically demonstrated through an analysis of localized carbon monoxide concentrations. Areas of vehicle congestion have the potential to create carbon monoxide hot spots. These hot spots typically occur at intersections where vehicle speeds are reduced and idle time is increased. Intersections that tend to exhibit a significant carbon monoxide concentration typically operate at level of service (LOS) D or worse. During preparation of the 2003 AQMP, the SCAQMD modeled the four most congested intersections in the Basin to demonstrate that no exceedances of the carbon monoxide standard would occur. The four selected intersections were Long Beach Boulevard/Imperial Highway, Wilshire Boulevard/Veteran Avenue, Highland Avenue/Sunset Boulevard, and Century Boulevard/La Cienega Boulevard. The analysis demonstrated that even the most congested intersections in the Basin would not experience a carbon monoxide hot spot.

Based on the traffic study prepared by Urban Crossroads for the project (Urban Crossroads 2010a), the project would generate 584 average daily trips (ADT), or about 10 ADT for each unit. The traffic analysis study area for the project is defined as the Cataract Avenue/Foothill Boulevard intersection because all traffic from the project would exit the site through this intersection. The intersection currently operates at a LOS B during the AM peak hour and LOS C during the PM peak hour. With implementation of the proposed project, the Cataract Avenue/Foothill Boulevard intersection would operate at a LOS C during the AM and PM peak hours. Therefore, the project would not substantially increase traffic at the Cataract Avenue and Foothill Boulevard intersection and no impact associated with a carbon monoxide hotspot would occur.

Localized Sensitive Receptors

Local sensitive receptors include the existing residential development surrounding the project site. Additionally, because residences on the project site would be developed over a period of more than four years, some residential development would potentially be occupied while other units are under construction; therefore, the earlier occupied residences would be considered sensitive receptors during the building and architectural coating phases of construction of the latter-constructed residences. In

accordance with the SCAQMD methodology, actual receptor locations with respect to the project should be used when available. The proposed residences would be a minimum of 25 feet (8 meters) apart from each other. The localized significance thresholds for a distance of 25 meters (80 feet) have been used for the analysis of impacts to the proposed occupied residences during the building and architectural coating phases of construction because 25 meters is the minimum distance for which thresholds have been established.

The closest existing residence to the project site is the residence located south of the project site with a driveway that runs parallel to Cataract Avenue. This residence is located approximately 400 meters (1,300 feet) from the nearest residential lot on the project site, and approximately 50 meters (160 feet) from Cataract Avenue, which would undergo utilities and drainage improvement as part of the proposed project. However, since Cataract Avenue is already developed, demolition and grading of this roadway would not be required within 50 meters (160 feet) of the off-site residence. Therefore, the significance thresholds for 50 meters (160 feet) of separation distance are used for impacts to the off-site residence during all phases of construction except demolition and mass grading. No thresholds are established for a distance of 400 meters (1,300 feet). Therefore, the significance thresholds for 200 meters (660 feet) of separation distance are used for impacts to the off-site residence during the demolition and mass grading phases of construction.

A comparison of the maximum construction emissions from the proposed project and the localized significance thresholds for construction are shown in Table 14. As shown in Table 14, pollutant emissions from construction of the proposed project would not exceed the localized significance thresholds at the proposed residences because emissions from the building construction and coating phases would not exceed the localized significance thresholds for a receptor located 25 meters (80 feet) away. Construction would not exceed the thresholds at the off-site residence during any phase of construction except the grading phase. Emissions of PM_{10}, and $PM_{2.5}$ would exceed the localized significance thresholds at the closest existing off-site residence during the grading phase of construction and would, therefore, result in a significant impact to a sensitive receptor.

Toxic Air Contaminants

The proposed residential land uses within the proposed development would not attract diesel trucks. Diesel trucks are associated with the transportation of goods from distribution centers and would not make deliveries to a residential development. Additionally, residential land use is not considered a source of TAC emissions in ARB's Air Quality and Land Use Handbook (2005). However, residential land uses are considered to be a sensitive land use by the ARB. With regard to off-site sources of TAC emissions, the ARB recommends siting distances for new sensitive land uses away from land uses identified as sources of TACs, such as freeways, rail yards, ports, refineries, dry cleaners, and large gas dispensing facilities. The land uses surrounding the project site are residential uses that would not be sources of TAC emissions. The nearest potential sources of TAC emissions would be the Interstate (I) 210 freeway and Foothill Boulevard, a major roadway. ARB recommends siting sensitive land uses more than 500 feet (0.1 mile) from freeways and major roadways. I-210 is located approximately 0.6 mile south of the project site and Foothill Boulevard is located approximately 0.3 mile south of the project site. Therefore, the proposed project would not be sited near a source of TAC emissions and the potential impact would be less than significant.

Table 14 Localized Construction Emissions Concentrations

Construction Phase	Maximum Construction Emissions (pounds/day)			
	CO	NO_X	PM_{10}	$PM_{2.5}$
Impacts to Proposed Residences				
Building Construction and Coating	31	17	1	1
Allowable emissions at 25 meters (80 feet)	1,566	236	12	7
Significant Impact?	No	No	No	No
Impacts to Off-site Residence – Demolition and Mass Grading				
Demolition	5	7	1	1
Mass Grading[(1)]	60	141	**7,725**	**1,617**
Allowable emissions at 200 meters (660 feet)	7,011	426	82	28
Significant Impact?	No	No	**Yes**	**Yes**
Impacts to Off-site Residence – All Other Construction Phases				
Trenching	9	15	1	1
Paving	10	15	1	1
Building Construction and Coating	31	17	1	1
Allowable emissions at 50 meters (160 feet)	2,158	265	36	9
Significant Impact?	No	No	No	No

[(1)] Assuming a maximum land disturbance of five acres per day.
Bold = significant impact
CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Source: URBEMIS 2007, SCAQMD 2009b

Mitigation Measures

Implementation of the project would result in a less than significant impact with respect to the exposure of sensitive receptors to excessive carbon monoxide hotspots and toxic air contaminants. No mitigation is required for these issues. The project would have the potential to result in a significant impact to localized sensitive receptors from PM_{10} and $PM_{2.5}$ emissions during grading. Mitigation measures AQ-1 and AQ-2 would minimize the proposed project's emissions of PM_{10} and $PM_{2.5}$, which would reduce the impact to localized sensitive receptors. As discussed in Section 6.2, Conformance with Federal and State Ambient Air Quality Standards, mitigation measure AQ-2B would be infeasible for the project and would not be implemented.

Significance after Mitigation

Table 15 compares the mitigated project emissions (with implementation of mitigation measure AQ-1) to the localized significance thresholds. As shown in this table, even with implementation of mitigation measure AQ-1, impacts related to PM_{10} and $PM_{2.5}$ would be significant. This impact would be significant and unavoidable.

Table 15 Mitigated Localized Construction Emissions Concentrations

	Mitigated Maximum Construction Emissions	
	PM_{10} (lbs/day)	**$PM_{2.5}$ (lbs/day)**
Mass Grading Emissions With Implementation of Mitigation Measure AQ-1[(1)]	468	99
Allowable emissions at 200 meters	**57**	**18**
Significant Impact?	**Yes**	**Yes**

[(1)] Assuming a maximum land disturbance of five acres per day.
Bold = significant impact
Source: URBEMIS 2007, SCAQMD 2009b

6.4 Objectionable Odors

Thresholds of Significance

Based on Appendix G of the CEQA Guidelines and the SCAQMD Handbook, the proposed project would result in a potentially significant impact if it would create objectionable odors affecting a substantial number of people.

Impact Analysis

Construction associated with implementation of the proposed project could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. However, construction equipment would be operating at various locations throughout the project site and construction would not take place all at once. In addition, construction near existing sensitive receptors would be temporary. Therefore, impacts associated with nuisance odors during project construction would not be significant.

The ARB's Air Quality and Land Use Handbook identifies a list of the most common sources of odor complaints received by local air districts. Typical sources of odor complaints include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations. The project proposes the development of residential land uses on the project site. Residential development does not typically result in a source of nuisance odors associated with operation. Therefore, project odors would not be considered objectionable and odor impacts would be less than significant.

Mitigation Measures

No mitigation is required.

6.5 Cumulative Impacts

The Basin is in non-attainment for PM_{10}, $PM_{2.5}$, and ozone. ROGs and NOx are precursors that form ozone through chemical and photochemical reactions in the atmosphere. Therefore, a significant cumulative impact exists with respect to air quality resulting from air quality violations of PM_{10}, $PM_{2.5}$, ROG, and NOx emissions.

CEQA Section 21100 (e) addresses evaluation of cumulative effects allowing the use of approved land use documents in a cumulative impact analysis. CEQA Guidelines Section 15064 (i)(3) further stipulates that for an impact involving a resource that is addressed by an approved plan or mitigation program, the lead agency may determine that a project's incremental contribution is not cumulatively considerable if the project complies with the adopted plan or program.

In addressing cumulative effects for air quality, the AQMP is the most appropriate document to use. The AQMP sets forth a comprehensive program that will lead the Basin, including the project area, into compliance with all federal and state air quality standards. Further, this document uses control measures and related emission reduction estimates based upon emissions projections for a future development scenario derived from land use, population, and employment characteristics defined in consultation with local governments.

Impact Analysis

Conformance to Federal and State Ambient Air Quality Standards – Cumulatively Considerable Net Increase of Criteria Pollutants

Based on Appendix G of the CEQA Guidelines and the SCAQMD Handbook, a project would result in a significant impact if it would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under applicable federal or state ambient air quality standard.

The geographical context for this analysis is the Basin. The Basin is in non-attainment for PM_{10}, $PM_{2.5}$, and ozone. ROGs and NO_x are precursors that form ozone through chemical and photochemical reactions in the atmosphere. Therefore, there is an existing significant cumulative impact in the Basin resulting from air quality violations of PM_{10}, $PM_{2.5}$, ROG, and NO_x emissions.

Construction

As discussed in Section 6.2, Conformance to Federal and State Ambient Air Quality Standards, emissions of NO_x, PM_{10}, and $PM_{2.5}$ from mass grading during construction of the proposed project would exceed established thresholds. Based on an air emissions dispersion equation used by the SCAQMD to determine localized PM_{10} concentrations, a significant cumulative impact would occur if two projects are located close enough to each other that their combined construction emissions would exceed the screening level thresholds. The acceptable distance threshold between projects in 150 meters (500 feet), at which distance the PM_{10} concentration generally decreases by approximately 99.9 percent (Urban Crossroads 2007). Based on information provided by the City of San Dimas and the City of Glendora (2010), all of the cumulative projects in the vicinity of the proposed project are located south of Foothill Boulevard, with the exception of four projects. The nearest cumulative project is the Cataract project, which proposes 17 residential units at the intersection of Cataract Avenue and Foothill Boulevard. This project is located approximately 650 feet from the proposed improvements on Cataract Avenue, and approximately 3,000 feet from the nearest proposed residential lot on the project site. Therefore, this cumulative project is not located within 150 meters (500 feet) of the proposed project and emissions from this project would not combine with those from the proposed project to result in a significant cumulative PM_{10} impact. Although settling properties for $PM_{2.5}$ and dispersion properties for NO_x are slightly different from PM_{10}, it can reasonably be assumed that due to the distance (650 feet) between the proposed project and the nearest cumulative project, emissions of $PM_{2.5}$ and NO_x from the proposed project and the Cataract project would also not combine to be significant.

However, the proposed project alone would have the potential to exceed the significance thresholds for NO_x, PM_{10}, and $PM_{2.5}$ during mass grading. Because there is an existing significant cumulative impact in the Basin resulting from air quality violations of PM_{10}, $PM_{2.5}$, ROG, and NO_x emissions, any exceedance of these thresholds would be considered a significant cumulative impact. Implementation of mitigation measure AQ-2a would reduce NO_x emissions to a level below its significance threshold. With implementation of mitigation measures AQ-2a, emissions of NO_x would not be cumulatively considerable. Mitigation measures AQ-2a would also reduce the PM_{10}, and $PM_{2.5}$ emissions, but not to below a significant level. Therefore, the proposed project's contribution of PM_{10} and $PM_{2.5}$ emissions would be cumulatively considerable and unavoidable.

Operational

Based on the analysis presented in Section 6.2, Conformance to Federal and State Ambient Air Quality Standards, implementation of the proposed project would not exceed any significance thresholds for operational impacts. As discussed above, none of the cumulative projects would be located close enough to the project site (within 150 meters) to result in a combined exceedance of a significance threshold. Additionally, as discussed in Section 6.1, Consistency with Regional Plans, the proposed project would be consistent with projected growth in the SCAQMD and, therefore, emissions from the project have already been accounted for in the 2007 AQMP. Therefore, operational emissions of the proposed project would not be cumulatively considerable.

Sensitive Receptors

Carbon Monoxide Hotspots

The geographic context for the analysis of cumulative impacts relative to exposure of sensitive receptors to carbon monoxide hot spots includes the intersection of Cataract Avenue/Foothill Boulevard, which was evaluated in the traffic analysis prepared for the proposed project (Urban Crossroads 2010a). Most of the cumulative projects would be located south of Foothill Boulevard. Therefore, cumulative project traffic would generally be concentrated on the roadways south of Foothill Boulevard and would not result in a cumulative increase in traffic at the Cataract Avenue/Foothill Boulevard intersection that would result in a carbon monoxide hot spot. However, one cumulative project, the Cataract Project, proposes 17 residential units at the intersection of Cataract Avenue and Foothill Boulevard. Three other projects are located in the vicinity of this intersection: the Tract 46680 and Tract 46916 projects, which propose a total of 30 residential units near the intersection of Foothill Boulevard and Lone Hill Avenue; and the Glendora Commons project, which proposes a 52,000 square feet shopping center on Amelia Avenue, south of Foothill Boulevard. According to the traffic analysis, with implementation of the proposed project and the cumulative projects, the Cataract Avenue/Foothill Boulevard intersection would operate at a LOS C during the AM peak hour and LOS D during PM peak hours in 2014 (Urban Crossroads 2010a). The proposed project, in combination with the cumulative projects, would have the potential to generate a carbon monoxide hot spot because the Cataract Avenue/Foothill Boulevard intersection would operate at a LOS D during the PM peak hour with implementation of the cumulative projects.

However, as discussed in Section 6.3, Impacts to Sensitive Receptors, during preparation of the 2003 AQMP, the SCAQMD modeled the four most congested intersections in the Basin to demonstrate that no exceedances of the carbon monoxide standard would occur. The analysis demonstrated that even the most congested intersections in the Basin would not experience a carbon monoxide hot spot. The Cataract Avenue/Foothill Boulevard intersection would not be as congested as these intersections,

which all operated at below a LOS D at the time of the study. Therefore, implementation of the cumulative projects and the proposed project would not generate a carbon monoxide hot spot at the Cataract Avenue/Foothill Boulevard intersection. A cumulative impact to sensitive receptors exposed to carbon monoxide hot spots would not occur

6.6 Greenhouse Gas Emissions and Conflicts With Adopted Plans

Thresholds of Significance

Based on Appendix G of the CEQA Guidelines, the proposed SCAQMD GHG thresholds, and the City of San Dimas, the City has determined that the project would result in a significant impact if it would:

1. Generate more than 3,000 MT CO_2e annually;
2. Result in energy usage that would not exceed Title 24 standards by 10 percent; and
3. Not incorporate additional project features that would facilitate enhanced energy conservation by maximizing opportunities for usage of solar power.

To determine the significance of GHG emissions during construction, construction emissions would be amortized over the lifetime of the project and added to operational emissions.

The above thresholds were determined to be applicable to the proposed project by the City of San Dimas, based on its independent review and consideration of the proposed thresholds of the SCAQMD. Section 15064.4 (b) of the CEQA Guidelines states that a lead agency should consider the following factors when assessing the significance of impacts from greenhouse gas emissions on the environment:

1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

Additionally, Section 15064.4(a) of the CEQA Guidelines states that the determination of the significance of GHG emissions should rely on a qualitative analysis or performance based standards.

The significance thresholds are consistent with the first consideration because the SCAQMD has already conducted and made available the results of its research to propose the 90 percent emissions capture rate for the region. Therefore, SCAQMD has determined the level of GHG emissions generated as a result of development in the Basin that would result in a cumulatively considerable contribution of GHG compared to the existing environmental setting, as discussed below. In addition, the threshold is consistent with the second consideration because the City of San Dimas includes specific guidelines that go beyond, or exceed, what it currently recommended by SCAQMD. The City has determined that the threshold of significance should also include a ten percent exceedance of Title 24 standards as the

appropriate criteria because the Title 24 standards become more stringent on a regular basis. The City has also included in the significance threshold that the project must have enhanced opportunities supporting and facilitating the use of solar power to demonstrate that the project's impacts would continue to operate at below a level of significance. The thresholds are consistent with the third consideration because the incorporation of the recommendations of SCAQMD would be consistent with a local plan for reduction of greenhouse gas emissions. Though the thresholds have not been adopted by the SCAQMD, the research supporting the GHG emissions thresholds has been completed and made available. The City has analyzed and independently reviewed this information and has determined that the thresholds of significance comply with Section 15064.4(a) of the CEQA Guidelines because the thresholds require a qualitative analysis and establish performance based standards.

Due to the global nature of assessment of GHG emissions and the effects of climate change, impacts can currently only be analyzed from a cumulative context. The proposed project is not capable of generating enough GHG emissions to influence global climate change on its own; however, GHG emissions present cumulative concerns for the state, regional, national and global climate. In this regard, the project would participate in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. A 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. A threshold based on a 90 percent emissions rate would determine whether a project's incremental contribution to a cumulative effect is cumulatively considerable. Therefore, this analysis includes both the Project and cumulative impacts.

Impact Analysis

The following discussion reviews each of the GHGs and the project's potential generation of these gases.

Construction Emissions

Implementation of the proposed project would emit GHG during construction from the operation of construction equipment and from worker and building supply vendor vehicles. Construction is based on the assumptions listed in Section 6.2, Conformance to Federal and State Ambient Air Quality Standards. As discussed in Section 6.2, the URBEMIS2007 model does not take into account the additional construction standards that have been adopted by the ARB after 2007. Therefore, this analysis is a conservative approach and actual project emissions may be less than calculated by the URBEMIS2007 model. Build out of the project is anticipated to take about 5.25 years to complete. The phases of construction would include demolition, mass grading, paving, building construction, and architectural coating. Construction emissions from each phase, and total GHG emissions during construction, are shown in Table 16.

CO_2e emissions associated with construction of the proposed project would contribute approximately 2,957 MT CO_2e to the regional GHG inventory. To determine the contribution of construction emissions to the total annual GHG emissions associated with the proposed project, GHG emissions from construction are amortized over the lifetime of the proposed project. The lifetime of the project is assumed to be 30 years. Therefore, construction of the proposed project would contribute 99 MT CO_2e to the total annual emissions associated with operation of the proposed project, discussed below.

Table 16 Estimated GHG Emissions from Project Construction

Construction Phase	CO_2e (metric tons)
Demolition	8
Mass Grading	1,095
Trenching	19
Paving	47
Building Construction	1,786
Coating	2
Total GHG Emissions	**2,957**

Source: URBEMIS 2007 (output data is provided in Appendix B)

Operational Emissions

Implementation of the proposed project would generate GHG emissions through the operation of new residences. Operational GHG emissions from the proposed project would include direct sources such as motor vehicles, natural gas consumption, solid waste handling/treatment, and indirect sources such as electricity generation and water use. Projected annual emissions from the project, including the amortized construction emissions determined above, are summarized in Table 17.

Table 17 Estimated Annual Operational GHG Emissions

Source of Emissions	Brasada Residential Project Build Out	
	CO_2e (metric tons)	Percent of Total Emissions
Vehicular Use	1,018	53
Electricity Use	362	18
Natural Gas Use	266	14
Solid Waste	95	5
Water Use	91	5
Construction Emissions (amortized)	99	5
Annual Total	**1,931**	**100**

Source: URBEMIS 2007 (Version 9.2.2). California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide GHG Emissions, Version 2.2, March 2007; EPA 1998; Navigant Consulting. 2006 (output data is provided in Appendix B)

Vehicle Use. At project build out, the largest source of GHG emissions would be motor vehicle use. Carbon dioxide emissions, the primary GHG associated with mobile sources, are directly related to the quantity of fuel consumed. Two important determinants of transportation-related GHG emissions are VMT and vehicle fuel efficiency. VMT in California has steadily increased over the last quarter-century (CEC 2006e) while fuel efficiency has remained level.

The vehicular GHG emissions from operation of the project were estimated using URBEMIS 2007. Vehicular emissions are based on a net increase of about two million annual VMT generated by the proposed project. Traffic data is based on VMT calculated by Urban Crossroads (2010b) for the

proposed project. Implementation of the project would generate an additional 1,018 MT CO_2e per year from vehicular sources. Vehicular use would generate about 53 percent of total GHG emissions generated from implementation of the project.

Electricity Use. Projects that would result in an increase in electricity consumption also result in an indirect increase in GHG emissions. The generation of electricity through the combustion of fossil fuels typically yields carbon dioxide and, to a much smaller extent, methane and nitrous oxide. The electricity emissions associated with the project were estimated by Galen T. Colley Electric (2010), through consultation with Southern California Edison, using the average energy consumption for the City of San Dimas. Because the project would accommodate large lot development that would include additional rooms and potentially more energy-using devices, it was determined that the proposed project would utilize approximately 10 percent more energy compared to the average home in San Dimas. The proposed project is expected to result in a net increase of approximately one million kWh per year. Annual increase in GHG emissions from electricity generation is estimated to be 362 MT CO_2e, approximately 18 percent of total project GHG emissions.

Natural Gas Use. The project would generate direct emissions from on-site sources such as natural gas usage and, to a much smaller extent, landscaping equipment. Based on the proposed project's electricity consumption determined by Galen T. Colley Electric, discussed above, a ten percent increase compared to average natural gas consumption was also assumed because large lot development would potentially require additional natural gas for heating due to the large home sizes in the project. The proposed project is expected to result in a net increase of approximately 50,105 therms per year. Increased annual GHG emissions associated with natural gas usage are estimated to be 266 MT CO_2e per year, approximately 14 percent of total project GHG emissions.

Solid Waste. Solid waste generated by the proposed project would also contribute to GHG emissions. Treatment and disposal of municipal, manufacturing, and other solid waste produces significant amounts of methane. GHG emissions from solid waste generated by the project were estimated based on formulas provided in the State Workbook: Methodologies for Estimating GHG Emissions (EPA 1998), which provides generation factors of GHG from degradation and outgassing of landfill material. Landfill gas is approximately 50 percent methane and 50 percent carbon dioxide. According to the Workbook, nitrous oxide emissions from landfills are considered negligible. The project would result in an estimated increase in annual emissions of GHG from solid waste of 95 MT CO_2e per year, approximately five percent of total project GHG emissions.

Water Use. Water use can also be an indirect source of GHG emissions due to the energy required to provide, treat, and distribute water to southern California (and specifically the project site). In 2006, the California Energy Commission (CEC) published a report (Navigant 2006) that estimated the magnitude and intensity of water-related energy consumption by segment of the water-use cycle. These estimates were used to develop a representative evaluation of the amount of energy deemed embedded in a unit of water, by virtue of the amount of energy consumed in collecting, extracting, conveying, treating, and distributing the water to end users and then by treating and disposing of the wastewater. The CEC estimates distinguish between indoor and outdoor water use, and whether the end user is in northern or southern California.

Using these estimates, an estimation of energy use related to the net increase in water demand associated with the project was calculated, and then the CCAR protocols for GHG emissions were used

to predict GHG emissions. For implementation of the proposed project, it is estimated that water demand would increase by about 50 million gallons per year. This water demand would result in indirectly emitting about 91 additional MT CO_2e, approximately one percent of total project GHG emissions.

Other GHG Emissions. Ozone is also a GHG; however, unlike the other GHG, ozone in the troposphere is relatively short lived and therefore is not global in nature. According to ARB, it is difficult to make an accurate determination of the contribution of ozone precursors (NO_X and VOCs) to global warming (ARB 2004). Therefore, it is assumed that emissions of ozone precursors associated with implementation of the proposed project would not significantly contribute to climate change. At present, there is a federal ban on CFCs; therefore, it is assumed that the proposed project would not generate emissions of these GHG. Implementation of the project may emit a small amount of HFC emissions from leakage and service of refrigeration and air conditioning equipment and from disposal at the end of the life of the equipment. However, the details regarding refrigerants to be used at future development and the capacity of these are unknown at this time. PFCs and sulfur hexafluoride are typically used in industrial applications. No industrial operations would occur under the project. Therefore, it is not anticipated that implementation of the project would contribute significant emissions of these additional GHG.

As shown in Table 17, the proposed project would result in annual operational emissions of GHG of 1,931 MT CO_2e. The largest contributor of GHG is a result of vehicular use, which contributes over half (53 percent) of the overall total increase in emissions. The second largest contributor of emissions associated with proposed project implementation is electricity use (18 percent), followed by natural gas use (14 percent), solid waste generation (five percent), water use (five percent), and amortized construction emissions (five percent). Therefore, GHG emissions as a result of the proposed project would not exceed the 3,000 MT CO_2e significance threshold. Additionally, all residences would be required to demonstrate that operation of the residence would exceed Title 24 standards by 10 percent or more prior to issuance of a building permit.

The GHG estimate does not include any GHG reducing measures and represents the business as usual emissions that would result from the proposed project. The CAT, established by Executive Order S-3-05, has recommended strategies to reduce GHG emissions at a statewide level to meet the statewide GHG emission reduction goals of the executive order. In addition, the 2008 CAPCOA report, *CEQA and Climate Change*, includes numerous GHG reducing measures. The California Attorney General's Office has also published a list of recommendations of GHG reducing measures. Even though the business as usual GHG emissions associated with the proposed project would not exceed the GHG emissions threshold, the project would implement several feasible and applicable measures recommended by the CAT, California Attorney General, and CAPCOA, as well as the applicable recommendations of the City of San Dimas Residential Energy Savings Guide to further reduce GHG emissions below those identified in significance thresholds, as shown in Table 4.6-4. The recommendations of the Residential Energy Savings Guide generally apply to resident behavior, such as using fluorescent instead of incandescent bulbs; those listed in Table 18 are the recommendations that can be implemented as part of the project. Incorporation of the measures in Table 18 would reduce overall GHG emissions from the proposed project. CAPCOA provides some basic estimates of GHG emission reductions that may be expected with incorporation of measures listed in Appendix B, Table 16 of the January 2008 report, *CEQA and Climate Change*. It should be noted that reduction estimates vary widely and not all recommended measures have reduction estimates associated with them. Further reductions may be expected though incorporation of the measures recommended by the CAT and California Attorney General, though the

extent of the reduction is not readily quantifiable at this time. Additionally, URBEMIS 2007 represents a conservative analysis. As discussed in Section 2.0, Project Description, the proposed project is a tentative tract map for the future development of 61 homes. For the purposes of CEQA review, is assumed that 61 homes would be developed as a result of the proposed project; however, at this time, the project applicant cannot guarantee that some GHG reducing measures would be incorporated into each individual home. Table 19 provides the CAPCOA estimates for reductions that may be expected for each project-incorporated CAPCOA measure that the project applicant can require for future development. Table 20 provides the approximate reduction in project-related GHG emissions associated with implementation of these required measures. Incorporation of project features listed in Table 18 is estimated to reduce the project's overall GHG emissions by approximately three percent.

In addition, the energy saving measures listed in Table 18 include enhanced opportunities for the future use of solar power. Solar power can be passive or active. Passive solar power uses heat and light from the sun directly. Active solar power uses systems to capture the sun's energy. The proposed project would include the following opportunities for active and passive solar power:

- Active
  - All residences would, at a minimum, be photovoltaic (PV) solar panel-ready. All roof structures would be designed, engineered, and constructed so that PV solar panels could be installed by a homeowner. Homes would also be oriented on site to allow for PV panel solar access.
  - Solar heating would be required for all pools and spas, where feasible.
- Passive
  - Approximately 30 percent of homes developed on the project site would be oriented to face north or south.
  - Energy-reducing shading mechanisms would be installed on windows, porches, patios and walkway overhangs where appropriate to maximize shade in the summer and maximize solar access to walls and windows in the winter.
  - Skylights would be installed in homes wherever feasible, provided the privacy of residents would be adequately maintained.
  - The architectural guidelines for the HOA would encourage passive solar design.

Therefore, the proposed project would not result in emissions that would exceed 3,000 MT CO_2e, would result in energy usage that would exceed Title 24 by 10 percent, and would enhance future opportunities for the use of solar power. The proposed project would not result in a significant impact related to GHG emissions during operation.

Table 18 GHG Emission Reductions Estimates for Project Design Features

Strategy	Project Feature
CAPCOA Measures [1]	
Traffic Calming Project design includes pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming features. All sidewalks internal and adjacent to project site are minimum of five feet wide. All sidewalks feature vertical curbs. Roadways that converge internally within the project are routed in such a way as to avoid "skewed intersections" which are intersections that meet at acute, rather than right, angles. Intersections internal and adjacent to the project feature one or more of the following pedestrian safety/traffic calming design techniques: marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, and roundabouts or mini-circles. Streets internal and adjacent to the project feature pedestrian safety/traffic calming measures such as on-street parking, planter strips with street trees, and chicanes/chokers (variations in road width to discourage high-speed travel).	The proposed roadway network avoids skewed intersections. All intersections are right angles. A median strip and a turnaround would be provided at the entrance to the project. This median is for a community mail pickup structure. The roadway network would curve throughout the site and would also be subject to elevation changes. These features would also help to calm traffic. Due to the steep topography of the site and the narrow width of the project roadways, no sidewalks or designated bike lines would be provided on the project site.
NEV Access Make physical development consistent with requirements for neighborhood electric vehicles. Current studies show that for most trips, NEVs do not replace gas-fueled vehicles as the primary vehicle.	Neighborhood electric vehicles (an electric vehicle with a maximum speed of 25 mph) would be allowed on all project roadways.
Recharging Area Provide residential buildings with a "utility" room or space for recharging batteries, whether for use in a car, electric Lawnmower, other electric landscaping equipment, or even batteries for small items such as flashlights.	All homes would include an electric vehicle (EV) hookup and have space to recharge small equipment. A location for recharging the electrical equipment necessary for maintenance of homeowner's association (HOA) landscaping would also be provided.
Enhanced Recycling/Waste Reduction, Reuse, Composing Provide infrastructure/education that promotes the avoidance of products with excessive packaging, recycle, buying of refills, separating of food and yard waste for composting, and using rechargeable batteries.	Residential solid waste pickup service in the City of San Dimas is provided by Waste Management. The City and Waste Management would supply each residence with a bin for trash, a bin for recyclables, and a bin for green waste.
Landscaping Project shall use drought resistant native trees, trees with low emissions and high carbon sequestration potential. Evergreen trees on the north and west sides afford the best protection from the setting summer sun and cold winter winds. Additional considerations include the use of deciduous trees on the south side of the house that will admit summer sun; evergreen plantings on the north side will slow cold winter winds; constructing a natural planted channel to funnel summer cooling breezes into the house. Neighborhood CCR's not requiring that front and side yards of single family homes are planted with turf grass. Vegetable gardens, bunch grass, and low-water landscaping shall also be permitted, or even encouraged.	All landscaping on the project site would comply with the City's Water Efficient Landscape Ordinance. Compliance would be required for all residential lots and public spaces, even if a particular lot does not meet the minimum of 2,500 square feet of landscaped space. The HOA guidelines would include guidelines to encourage homeowners to orient homes to take advantage of natural heating and cooling elements.
Wood Burning Fireplaces/Stoves Project does not feature fireplaces or wood burning stoves.	All fireplaces, indoor and outdoor, would be gas burning, as required by SCAQMD Rule 445.

Table 18. Continued

Strategy	Project Feature
Natural Gas Stove Project features only natural gas or electric stoves in residences.	All stoves would be natural gas or electric stoves. No wood burning stoves would be permitted, as required by SCAQMD Rule 445.
On-site Renewable Energy System Project provides on-site renewable energy system(s). Nonpolluting and renewable energy potential includes solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, projects may take advantage of net metering with the local utility.	All residences would, at a minimum, be PV solar panel-ready. All roof structures would be designed, engineered, and constructed so that PV solar panels could be installed by a homeowner. Homes would also be oriented on site to allow for PV panel solar access.
Solar Orientation Project orients 75% or more of homes and/or buildings to face either north or south (within 30° of N/S). Building design includes roof overhangs that are sufficient to block the high summer sun, but not the lower winter sun, from penetrating south facing windows. Trees, other landscaping features and other buildings are sited in such a way as to maximize shade in the summer and maximize solar access to walls and windows in the winter.	Approximately 30 percent of homes developed on the project site would be oriented to face north or south.
Energy Star Roof Project installs Energy Star labeled roof materials. **Cool Roofs** Project provides cool roofs. Highly reflective, highly emissive roofing materials that stay 50-60°F cooler than a normal roof under a hot summer sun. California's Cool Savings Program provided rebates to building owners for installing roofing materials with high solar reflectance and thermal emittance. The highest rebate went to roofs on air conditioned buildings, while buildings with rooftop ducts and other nonresidential buildings were eligible for slightly less. The program aimed to reduce peak summer electricity demand and was administered by the CEC.	Roofs on all non-accessory buildings would be designed to comply with "cool roof" standards. Heat reflective materials would be applied under roof shingles. Material colors for concrete shingles would be part of the architectural guidelines for the HOA.
Electric Yard Equipment Compatibility Project provides electrical outlets at building exterior areas.	All residences would supply at least one exterior electrical outlet
Energy Efficient Appliance Standards Project uses energy efficient appliances (e.g., Energy Star).	All appliances installed by the developer would be Energy Star rated appliances.
Green Building Materials Project uses materials which are resource efficient, recycled, with long life cycles and manufactured in an environmentally friendly way.	Building materials would be resource efficient, recycled, have long life cycles and manufactured in an environmentally friendly way, to the extent feasible.
Shading Mechanisms Install energy-reducing shading mechanisms for windows, porch, patio and walkway overhangs.	Energy-reducing shading mechanisms would be installed on windows, porches, patios and walkway overhangs where appropriate to maximize shade in the summer and maximize solar access to walls and windows in the winter.
Programmable Thermostats Install energy-reducing programmable thermostats that automatically adjust temperature settings.	All homes would install energy-reducing programmable thermostats, consistent with the 2008 California Building Energy Efficiency Standards (or later editions as applicable)for Residential and Non-Residential Buildings.

Table 18. Continued

Strategy	Project Feature
Passive Heating and Cooling Systems Install energy-reducing passive heating and cooling systems (e.g., insulation and ventilation).	Insulation would be installed in exterior walls and ceilings, consistent with the 2008 California Building Energy Efficiency Standards (or later editions as applicable) for Residential and Non-Residential Buildings.
Day Lighting Systems Install energy-reducing day lighting systems (e.g., skylights, light shelves and interior transom windows).	Skylights would be installed in homes wherever feasible, provided the privacy of residents would be adequately maintained.
Water Use Appliances Require the installation of low water use appliances.	The developer would install only low water use appliances, such as Energy Star appliances and power flush toilets.
GHG Emissions Reductions Education Provide local governments, businesses, and residents with guidance/protocols/information on how to reduce GHG emissions (e.g., energy saving, food miles).	The architectural guidelines for the HOA would include energy efficiency guidelines.
ARB Certified Diesel Construction Equipment Use ARB-certified diesel construction equipment.	Prior to issuance of a grading permit, the construction manager would demonstrate that the construction fleet will meet or exceed then current ARB standards.
Alternative Fuel Construction Equipment Use alternative fuel types for construction equipment.	Prior to issuance of a grading permit, the construction manager would demonstrate that electric or natural gas-powered construction equipment would be used in lieu of gasoline or diesel-powered engines, where feasible.
Local Building Materials Use locally-made building materials for construction of the project and associated infrastructure.	Prior to issuance of a grading permit, the construction manager would demonstrate that locally-made building materials would be used for project construction and associated infrastructure when appropriate materials are available and economically feasible.
Recycle Demolished Construction Material Recycle/reuse demolished construction material.	The proposed project would be subject to the Tier 2 provisions of the California Green Building Code requiring recycling/reuse of construction and demolition debris.
California Attorney General's Office Recommended Strategies [(2)]	
Energy Efficiency Use automatic covers, efficient pumps and motors, and solar heating for pools and spas.	Solar heating would be required for all pools and spas, where feasible.
Energy Efficiency Provide education on energy efficiency to residents, customers and/or tenants.	The architectural guidelines for the HOA would include energy efficiency guidelines.
Energy Efficiency Install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances, equipment, and control systems.	The proposed project limits public street lighting by installing lighting only in areas where light is required for security or safety.

Table 18. Continued

Strategy	Project Feature
Energy Efficiency Use passive solar design, e.g., orient buildings and incorporate landscaping to maximize passive solar heating during cool seasons, minimize solar heat gain during hot seasons, and enhance natural ventilation. Design buildings to take advantage of sunlight.	The architectural guidelines for the HOA would encourage passive solar design.
Energy Efficiency Install efficient lighting, (including LEDs) for traffic, street and other outdoor lighting.	The proposed project would install energy efficient lighting in street lamps and other lighting systems in the common areas of the project site.
Renewable Energy and Energy Storage Install solar, wind, and geothermal power systems and solar hot water heaters.	Solar heating would be required for all pools and spas, where feasible.
Renewable Energy and Energy Storage Install solar panels on unused roof and ground space and over carports and parking areas.	All residences would, at a minimum, be PV solar panel-ready. All roof structures would be designed, engineered, and constructed so that PV solar panels could be installed by a homeowner. Homes would also be oriented on site to allow for PV panel solar access.
Water Conservation and Efficiency Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods.	All landscaping on the project site would comply with the City's Water Efficient Landscape Ordinance.
Water Conservation and Efficiency Design buildings to be water-efficient. Install water-efficient fixtures and appliances.	The developer would install only low water use appliances.
Water Conservation and Efficiency Implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment.	Individual homes would be subject to water quality design standards that would require infiltration of water on site. Water quality basins are proposed throughout the development for collection of storm water.
Water Conservation and Efficiency Provide education about water conservation and available programs and incentives	The architectural guidelines for the HOA would include energy efficiency guidelines.
Solid Waste Measures Provide education and publicity about reducing waste and available recycling services.	All new residents would be provided with information about reducing waste and available recycling services in the City of San Dimas. The HOA would be responsible for providing an informational handout with this information.
Solid Waste Measures Integrate reuse and recycling into residential industrial, institutional and commercial projects.	Residential solid waste pickup service in the City of San Dimas is provided by Waste Management. Every residence would be supplied a bin for trash, a bin for recyclables, and a bin for green waste.
Solid Waste Measures Provide easy and convenient recycling opportunities for residents, the public, and tenant businesses.	Residential solid waste pickup service in the City of San Dimas is provided by Waste Management. Every residence would be supplied a bin for trash, a bin for recyclables, and a bin for green waste.
Land Use Measures Preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.	The proposed project would create more than 80 acres of conservation/open space within the project site. Trees would be replaced at a minimum ratio of two new trees to every one tree removed.

Table 18. Continued

Strategy	Project Feature
Diesel Anti-Idling Set specific limits on idling time for commercial vehicles, including delivery vehicles.	In 2004, the CARB adopted an Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling. The measure does not allow diesel fueled commercial vehicles to idle for more than five minutes at any given time. Construction managers on the project site would ensure compliance with this regulation.
California Climate Action Team Strategies [3]	
Achieve 50 percent Statewide Recycling Goal Achieving the state's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	Residential solid waste pickup service in the City of San Dimas is provided by Waste Management. Every residence would be supplied a bin for trash, a bin for recyclables, and a bin for green waste.
Urban Forestry A new statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	The proposed project would include new trees as a result of landscaping.
Water Use Efficiency Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions.	The developer would install only low water use appliances
California Solar Initiative Installation of 1 million solar roofs or an equivalent 3,000 MW by 2017 on homes and businesses; increased use of solar thermal systems to offset the increasing demand for natural gas; use of advanced metering in solar applications; and creation of a funding source that can provide rebates over 10 years through a declining incentive schedule.	All residences would, at a minimum, be PV solar panel-ready. All roof structures would be designed, engineered, and constructed so that PV solar panels could be installed by a homeowner. Homes would also be oriented on site to allow for PV panel solar access.
Diesel Anti-idling Post signs that restrict idling and provide education for truck drivers regarding diesel health impacts.	In 2004, the CARB adopted an Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling. The measure does not allow diesel fueled commercial vehicles to idle for more than five minutes at any given time. Construction managers on the project site would ensure compliance with this regulation.
City of San Dimas Residential Energy Savings Guide [4]	
Use light paint colors for your house's exterior. Lighter colors reflect heat better than darker ones.	A number of materials and color combinations would be included in the HOA architectural guidelines. The guidelines promote natural coloring that would blend into the vista and colors that would promote energy use reductions.

Table 18. Continued

Strategy	Project Feature
Insulate the attic, basement, and crawl space. About 20 percent of energy costs come from heat loss in those areas.	Insulation would be installed consistent with the 2008 Building Energy Efficiency Standards (or later editions as applicable) for Residential and Non-Residential Buildings.
Install fireplace draft stoppers, attic door covers, and dryer vent seals that open only when your dryer is in use.	The developer would install fireplace draft stoppers, attic door covers, and dryer vent seals that open only when the dryer is in use.
Plant trees. Evergreen trees on the north and west sides of your house can help block winter winds, and leafy trees on the south and west provide shade from the summer sun.	The proposed project would include new trees as a result of landscaping.
Replace older appliances with Energy Star rated appliances which offer rebates, including washers, dryers, dishwashers, refrigerators, and water heaters.	All appliances installed by the developed would be Energy Star rated appliances.

Sources: (1) California Air Pollution Control Officers Association (CAPCOA), CEQA & Climate Change. Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. January 2008. (2) Office of the California Attorney General. Global Warming Measures. The California Environmental Quality Act, Addressing Global Warming Impacts at the Local Agency Level. Updated 12/09/08. (3) State of California, Environmental Protection Agency, Climate Action Team, 2006. (4) City of San Dimas, Residential Energy Savings Guide. http://www.cityofsandimas.com/ps.developmentservices.cfm?ID=2476 Accessed June 15, 2010.

Table 19 GHG Emission Reductions Estimates for Project-Incorporated Measures

CAPCOA Measure	CAPCOA Estimated Reduction	Project Features That Would Implement Strategy	Project Reduction Estimate
Vehicular Use Measures			
Traffic Calming – Project design includes pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming features. All sidewalks internal and adjacent to project site are minimum of five feet wide. All sidewalks feature vertical curbs. Roadways that converge internally within the project are routed in such a way as to avoid "skewed intersections" which are intersections that meet at acute, rather than right, angles. Intersections internal and adjacent to the project feature one or more of the following pedestrian safety/traffic calming design techniques: marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, and roundabouts or mini-circles. Streets internal and adjacent to the project feature pedestrian safety/traffic calming measures such as on-street parking, planter strips with street trees, and chicanes/chokers (variations in road width to discourage high-speed travel).	1-10%	The proposed roadway network avoids skewed intersections. All intersections are right angles. A median strip and a turnaround would be provided at the entrance to the project. This median is for a community mail pickup structure. The roadway network would curve throughout the site and would also be subject to elevation changes. These features would also help to calm traffic. Due to the steep topography of the site and the narrow width of the project roadways, no sidewalks or designated bike lines would be provided on the project site.	1%
NEV Access – Make physical development consistent with requirements for neighborhood electric vehicles. Current studies show that for most trips, NEVs do not replace gas-fueled vehicles as the primary vehicle.	0.5-1.5%	Neighborhood electric vehicles (an electric vehicle with a maximum speed of 25 mph) would be allowed on all project roadways.	1.5%
Recharging Area – Provide residential buildings with a "utility" room or space for recharging batteries, whether for use in a car, electric lawnmower, other electric landscaping equipment, or even batteries for small items such as flashlights.	Low (0.5%)	All homes would include an electric vehicle (EV) hookup and have space to recharge small equipment. A location for recharging the electrical equipment necessary for maintenance of homeowner's association (HOA) landscaping would also be provided.	0.5%
Total Estimated Reduction in Vehicular Use Emissions			**3%**
Electricity Use			
Energy Star Roof – Project installs Energy Star labeled roof materials. **Cool Roofs –** Project provides cool roofs. Highly reflective, highly emissive roofing materials that stay 50-60°F cooler than a normal roof under a hot summer sun. California's Cool Savings Program provided rebates to building owners for installing roofing materials with high solar reflectance and thermal emittance. The highest rebate went to roofs on air conditioned buildings, while buildings with rooftop ducts and other nonresidential buildings were eligible for slightly less. The program aimed to reduce peak summer electricity demand and was administered by the CEC.	0.5-1%	Roofs on all non-accessory buildings would be designed to comply with "cool roof" standards. Heat reflective materials would be applied under roof shingles. Material colors for concrete shingles would be part of the architectural guidelines for the HOA.	1%

Table 19. Continued

CAPCOA Measure	CAPCOA Estimated Reduction	Project Features That Would Implement Strategy	Project Reduction Estimate
Energy Efficient Appliance Standards – Project uses energy efficient appliances (e.g., Energy Star).	Low (0.5%)	All appliances installed by the developer would be Energy Star rated appliances.	0.5%
Shading Mechanisms – Install energy-reducing shading mechanisms for windows, porch, patio and walkway overhangs.	Low (0.5%)	Energy-reducing shading mechanisms would be installed on windows, porches, patios and walkway overhangs where appropriate to maximize shade in the summer and maximize solar access to walls and windows in the winter.	0.5%
Programmable Thermostats – Install energy-reducing programmable thermostats that automatically adjust temperature settings.	Low (0.5%)	All homes would install energy-reducing programmable thermostats, consistent with the 2008 California Building Energy Efficiency Standards (or later editions as applicable) for Residential and Non-Residential Buildings.	0.5%
Day Lighting Systems – Install energy-reducing day lighting systems (e.g., skylights, light shelves and interior transom windows).	Low (0.5%)	Skylights would be installed in homes wherever feasible, provided the privacy of residents would be adequately maintained.	0.5%
Solar Orientation – Project orients 75% or more of homes and/or buildings to face either north or south (within 30° of N/S). Building design includes roof overhangs that are sufficient to block the high summer sun, but not the lower winter sun, from penetrating south facing windows. Trees, other landscaping features and other buildings are sited in such a way as to maximize shade in the summer and maximize solar access to walls and windows in the winter.	1%	Approximately 30 percent of homes developed on the project site would be oriented to face north or south.	0.5%
Total Estimated Reduction in Electricity Use Emissions			**3.5%**
Natural Gas			
Passive Heating and Cooling Systems – Install energy-reducing passive heating and cooling systems (e.g., insulation and ventilation).	Low (0.5%)	Insulation would be installed in exterior walls and ceilings, consistent with the 2008 California Building Energy Efficiency Standards (or later editions as applicable) for Residential and Non-Residential Buildings.	0.5%
Electric Yard Equipment Compatibility – Project provides electrical outlets at building exterior areas. (Would reduce GHG emissions from burning of fossil fuels)	Low (0.5%)	A requirement for exterior electrical outlets would be included in architectural guidelines for the HOA.	0.5%
Total Estimated Reduction in Natural Gas Use Emissions			**1%**
Solid Waste			
Enhanced Recycling/Waste Reduction, Reuse, Composing – Provide infrastructure/education that promotes the avoidance of products with excessive packaging, recycle, buying of refills, separating of food and yard waste for composting, and using rechargeable batteries.	Low (0.5%)	Residential solid waste pickup service in the City of San Dimas is provided by Waste Management. Every residence would be supplied a bin for trash, a bin for recyclables, and a bin for green waste.	0.5%
Total Estimated Reduction in Solid Waste Emissions			**0.5%**

Table 19. Continued

CAPCOA Measure	CAPCOA Estimated Reduction	Project Features That Would Implement Strategy	Project Reduction Estimate
Water Use			
Landscaping – Project shall use drought resistant native trees, trees with low emissions and high carbon sequestration potential. Evergreen trees on the north and west sides afford the best protection from the setting summer sun and cold winter winds. Additional considerations include the use of deciduous trees on the south side of the house that will admit summer sun; evergreen plantings on the north side will slow cold winter winds; constructing a natural planted channel to funnel summer cooling breezes into the house. Neighborhood CCR's not requiring that front and side yards of single family homes be planted with turf grass. Vegetable gardens, bunch grass, and low-water landscaping shall also be permitted, or even encouraged.	Low (0.5%)	All landscaping on the project site would comply with the City's Water Efficient Landscape Ordinance. Compliance would be required for all residential lots and public spaces, even if a particular lot does not meet the minimum of 2,500 square feet of landscaped space. The HOA guidelines would include guidelines to encourage homeowners to orient homes to take advantage of natural heating and cooling elements. The guidelines would allow gardens that are properly maintained or screened to prevent pests.	0.5%
Water Use Appliances – Require the installation of low-water use appliances.	Low (0.5%)	The developer would install only low water use appliances, such as Energy Star appliances and power flush toilets.	0.5%
Total Estimated Reduction in Water Use Emissions			**1%**
Construction			
ARB Certified Diesel Construction Equipment – Use ARB-certified diesel construction equipment.	Low (0.5%)	Prior to issuance of a grading permit, the construction manager would be required to demonstrate that the construction fleet meets or exceeds then current ARB standards.	0.5%
Alternative Fuel Construction Equipment – Use alternative fuel types for construction equipment.	Low (0.5%)	Prior to issuance of a grading permit, the construction manager would demonstrate that electric or natural gas-powered construction equipment would be used in lieu of gasoline or diesel-powered engines, where feasible.	0.5%
Local Building Materials – Use locally-made building materials for construction of the project and associated infrastructure.	Low (0.5%)	Prior to issuance of a grading permit, the construction manager would demonstrate that locally-made building materials would be used for project construction and associated infrastructure when appropriate materials are available and economically feasible.	0.5%
Recycle Demolished Construction Material – Recycle/reuse demolished construction material.	Low (0.5%)	The proposed project would be subject to the Tier 2 provisions of the California Green Building Code requiring recycling/reuse of construction and demolition debris.	0.5%
Green Building Materials – Project uses materials which are resource efficient, recycled, with long life cycles and manufactured in an environmentally friendly way.	Low (0.5%)	Building materials would be resource efficient, recycled, have long life cycles and manufactured in an environmentally friendly way, to the extent feasible.	0.5%
Total Estimated Reduction in Construction Emissions			**2.5%**

Source: California Air Pollution Control Officers Association (CAPCOA), CEQA & Climate Change. Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act (Appendix B, Table 16). January 2008.

Table 20 Estimated GHG Emission Reductions with Project Features

Use	Business as Usual Emissions (MT CO2e)	Project Reduction Estimate[1]	Emissions with Incorporation of GHG-Reducing Features (MT CO2e)
Vehicular Use	1,018	3%	987
Electricity Use	362	3.5%	349
Natural Gas Use	266	1%	263
Solid Waste	95	0.5%	95
Water Use	91	1%	90
Construction	99	2.5%	97
Total Project Emissions	1,931	3%[2]	1,881

(1) Sum of the measures listed in Table 19
(2) Percent change from total BAU GHG emissions to GHG emissions total with incorporation of CAPCOA measures

Mitigation Measures

The proposed project would not result in emissions that would exceed 3,000 MT CO_2e, would exceed Title 24 by 10 percent, and would have enhanced opportunities for use of solar power. The proposed project would not result in a significant impact related to GHG emissions; therefore, no mitigation is required.

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Air Quality and GHG Data

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\Environmental\Projects - Current\100015807 Brasada Residential Project EIR\Technical Reports\B Air Quality\URBEMIS\Brasada Residential.urb924

Project Name: Brasada Residential Project1

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	15.58	141.30	59.50	0.03	7,720.03	5.44	7,725.47	1,612.25	5.00	1,617.26	18,561.49
2012 TOTALS (lbs/day mitigated)	15.58	96.16	59.50	0.03	466.17	1.37	467.55	97.36	1.26	98.62	18,561.49
2013 TOTALS (lbs/day unmitigated)	5.15	16.18	28.81	0.03	0.13	1.05	1.19	0.05	0.96	1.01	4,537.44
2013 TOTALS (lbs/day mitigated)	3.96	16.18	28.81	0.03	0.13	1.05	1.19	0.05	0.96	1.01	4,537.44
2014 TOTALS (lbs/day unmitigated)	4.85	15.02	27.21	0.03	0.13	0.95	1.08	0.05	0.87	0.91	4,537.20
2014 TOTALS (lbs/day mitigated)	3.66	15.02	27.21	0.03	0.13	0.95	1.08	0.05	0.87	0.91	4,537.20
2015 TOTALS (lbs/day unmitigated)	4.57	13.86	25.74	0.03	0.13	0.88	1.01	0.05	0.80	0.85	4,536.99
2015 TOTALS (lbs/day mitigated)	3.37	13.86	25.74	0.03	0.13	0.88	1.01	0.05	0.80	0.85	4,536.99
2016 TOTALS (lbs/day unmitigated)	4.31	12.84	24.45	0.03	0.13	0.79	0.92	0.05	0.72	0.77	4,536.70
2016 TOTALS (lbs/day mitigated)	2.78	12.84	24.45	0.03	0.13	0.79	0.92	0.05	0.72	0.77	4,536.70

8/17/2010 05:01:40 PM

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	4.11	1.21	4.76	0.00	0.01	0.01	1,473.93

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	4.97	6.09	57.82	0.06	10.66	2.05	6,030.01

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	9.08	7.30	62.58	0.06	10.67	2.06	7,503.94

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/2/2012-1/31/2012 Active Days: 22	1.01	6.82	5.40	0.00	0.01	0.50	0.50	0.00	0.46	0.46	824.65
Demolition 01/01/2012-01/31/2012	1.01	6.82	5.40	0.00	0.01	0.50	0.50	0.00	0.46	0.46	824.65
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.98	6.77	4.49	0.00	0.00	0.49	0.49	0.00	0.45	0.45	700.30
Demo On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Worker Trips	0.03	0.05	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.35
Time Slice 2/1/2012-7/31/2012 Active Days: 130	**15.58**	**141.30**	**59.50**	0.01	**7,720.03**	**5.44**	**7,725.47**	**1,612.25**	**5.00**	**1,617.26**	**18,561.49**
Mass Grading 02/01/2012-07/31/2012	15.58	141.30	59.50	0.01	7,720.03	5.44	7,725.47	1,612.25	5.00	1,617.26	18,561.49
Mass Grading Dust	0.00	0.00	0.00	0.00	7,720.00	0.00	7,720.00	1,612.24	0.00	1,612.24	0.00
Mass Grading Off Road Diesel	15.45	141.06	55.19	0.00	0.00	5.42	5.42	0.00	4.99	4.99	17,970.84
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.13	0.25	4.31	0.01	0.03	0.02	0.04	0.01	0.01	0.02	590.64
Time Slice 8/1/2012-8/31/2012 Active Days: 23	1.83	15.29	8.92	0.00	0.01	0.74	0.74	0.00	0.68	0.68	1,838.98
Trenching 08/01/2012-08/31/2012	1.83	15.29	8.92	0.00	0.01	0.74	0.74	0.00	0.68	0.68	1,838.98

8/17/2010 05:01:40 PM

Trenching Off Road Diesel	1.80	15.24	8.01	0.00	0.00	0.73	0.73	0.00	0.67	0.67	1,714.64
Trenching Worker Trips	0.03	0.05	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.35
Time Slice 9/3/2012-11/30/2012 Active Days: 65	2.76	14.87	10.41	0.00	0.02	1.22	1.24	0.01	1.13	1.13	1,598.45
Asphalt 09/01/2012-11/30/2012	2.76	14.87	10.41	0.00	0.02	1.22	1.24	0.01	1.13	1.13	1,598.45
Paving Off-Gas	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.23	13.48	8.10	0.00	0.00	1.17	1.17	0.00	1.07	1.07	1,131.92
Paving On Road Diesel	0.10	1.28	0.50	0.00	0.01	0.05	0.06	0.00	0.05	0.05	217.84
Paving Worker Trips	0.05	0.10	1.82	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.69
Time Slice 12/3/2012-12/31/2012 Active Days: 21	5.47	17.36	30.55	**0.03**	0.13	1.17	1.30	0.05	1.07	1.12	4,537.74
Building 12/01/2012-03/31/2016	3.84	17.35	30.51	0.03	0.13	1.17	1.30	0.05	1.07	1.12	4,531.54
Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95	1,621.20
Building Vendor Trips	0.13	1.47	1.22	0.00	0.01	0.06	0.07	0.00	0.06	0.06	338.87
Building Worker Trips	0.57	1.07	18.77	0.03	0.12	0.07	0.19	0.04	0.06	0.10	2,571.48
Coating 12/01/2012-03/31/2016	1.64	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2013-12/31/2013 Active Days: 261	5.15	16.18	28.81	**0.03**	0.13	1.05	1.19	0.05	0.96	1.01	4,537.44
Building 12/01/2012-03/31/2016	3.51	16.18	28.77	0.03	0.13	1.05	1.19	0.05	0.96	1.01	4,531.25
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,621.20
Building Vendor Trips	0.12	1.30	1.12	0.00	0.01	0.05	0.06	0.00	0.05	0.05	338.88
Building Worker Trips	0.52	0.98	17.44	0.03	0.12	0.07	0.19	0.04	0.06	0.10	2,571.17
Coating 12/01/2012-03/31/2016	1.64	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2014-12/31/2014 Active Days: 261	4.85	15.02	27.21	**0.03**	0.13	0.95	1.08	0.05	0.87	0.91	4,537.20
Building 12/01/2012-03/31/2016	3.21	15.01	27.17	0.03	0.13	0.95	1.08	0.05	0.87	0.91	4,531.01
Building Off Road Diesel	2.63	12.97	9.89	0.00	0.00	0.82	0.82	0.00	0.76	0.76	1,621.20

8/17/2010 05:01:40 PM

Building Vendor Trips	0.11	1.14	1.04	0.00	0.01	0.05	0.06	0.00	0.04	0.05	338.89
Building Worker Trips	0.47	0.90	16.25	0.03	0.12	0.08	0.20	0.04	0.06	0.11	2,570.92
Coating 12/01/2012-03/31/2016	1.64	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2015-12/31/2015 Active Days: 261	4.57	13.86	25.74	**0.03**	0.13	0.88	1.01	0.05	0.80	0.85	4,536.99
Building 12/01/2012-03/31/2016	2.93	13.86	25.70	0.03	0.13	0.88	1.01	0.05	0.80	0.85	4,530.80
Building Off Road Diesel	2.40	12.04	9.62	0.00	0.00	0.76	0.76	0.00	0.70	0.70	1,621.20
Building Vendor Trips	0.10	1.00	0.95	0.00	0.01	0.04	0.05	0.00	0.04	0.04	338.91
Building Worker Trips	0.43	0.82	15.13	0.03	0.12	0.08	0.20	0.04	0.06	0.11	2,570.70
Coating 12/01/2012-03/31/2016	1.64	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2016-3/31/2016 Active Days: 65	4.31	12.84	24.45	**0.03**	0.13	0.79	0.92	0.05	0.72	0.77	4,536.70
Building 12/01/2012-03/31/2016	2.67	12.83	24.42	0.03	0.13	0.79	0.92	0.05	0.72	0.76	4,530.50
Building Off Road Diesel	2.19	11.19	9.40	0.00	0.00	0.67	0.67	0.00	0.62	0.62	1,621.20
Building Vendor Trips	0.09	0.88	0.88	0.00	0.01	0.04	0.05	0.00	0.03	0.04	338.91
Building Worker Trips	0.39	0.76	14.13	0.03	0.12	0.08	0.20	0.04	0.06	0.11	2,570.39
Coating 12/01/2012-03/31/2016	1.64	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19

8/17/2010 05:01:40 PM

Phase Assumptions

Phase: Demolition 1/1/2012 - 1/31/2012 - Type Your Description Here

Building Volume Total (cubic feet): 100000

Building Volume Daily (cubic feet): 0

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Mass Grading 2/1/2012 - 7/31/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 90

Maximum Daily Acreage Disturbed: 5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 65000 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

2 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

4 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

7 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 8/1/2012 - 8/31/2012 - Type Your Description Here

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 9/1/2012 - 11/30/2012 - Default Paving Description

Acres to be Paved: 9.45

8/17/2010 05:01:40 PM

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 12/1/2012 - 3/31/2016 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 12/1/2012 - 3/31/2016 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

8/17/2010 05:01:40 PM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/2/2012-1/31/2012 Active Days: 22	1.01	6.82	5.40	0.00	0.01	0.50	0.50	0.00	0.46	0.46	824.65
Demolition 01/01/2012-01/31/2012	1.01	6.82	5.40	0.00	0.01	0.50	0.50	0.00	0.46	0.46	824.65
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.98	6.77	4.49	0.00	0.00	0.49	0.49	0.00	0.45	0.45	700.30
Demo On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Worker Trips	0.03	0.05	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.35
Time Slice 2/1/2012-7/31/2012 Active Days: 130	**15.58**	96.16	**59.50**	0.01	466.17	1.37	467.55	97.36	1.26	98.62	**18,561.49**
Mass Grading 02/01/2012-07/31/2012	15.58	96.16	59.50	0.01	466.17	1.37	467.55	97.36	1.26	98.62	18,561.49
Mass Grading Dust	0.00	0.00	0.00	0.00	466.15	0.00	466.15	97.35	0.00	97.35	0.00
Mass Grading Off Road Diesel	15.45	95.92	55.19	0.00	0.00	1.36	1.36	0.00	1.25	1.25	17,970.84
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.13	0.25	4.31	0.01	0.03	0.02	0.04	0.01	0.01	0.02	590.64
Time Slice 8/1/2012-8/31/2012 Active Days: 23	1.83	15.29	8.92	0.00	0.01	0.74	0.74	0.00	0.68	0.68	1,838.98
Trenching 08/01/2012-08/31/2012	1.83	15.29	8.92	0.00	0.01	0.74	0.74	0.00	0.68	0.68	1,838.98
Trenching Off Road Diesel	1.80	15.24	8.01	0.00	0.00	0.73	0.73	0.00	0.67	0.67	1,714.64
Trenching Worker Trips	0.03	0.05	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.35
Time Slice 9/3/2012-11/30/2012 Active Days: 65	2.76	14.87	10.41	0.00	0.02	1.22	1.24	0.01	1.13	1.13	1,598.45
Asphalt 09/01/2012-11/30/2012	2.76	14.87	10.41	0.00	0.02	1.22	1.24	0.01	1.13	1.13	1,598.45
Paving Off-Gas	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.23	13.48	8.10	0.00	0.00	1.17	1.17	0.00	1.07	1.07	1,131.92
Paving On Road Diesel	0.10	1.28	0.50	0.00	0.01	0.05	0.06	0.00	0.05	0.05	217.84
Paving Worker Trips	0.05	0.10	1.82	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.69
Time Slice 12/3/2012-12/31/2012 Active Days: 21	3.87	17.36	30.55	**0.03**	0.13	1.17	1.30	0.05	1.07	1.12	4,537.74
Building 12/01/2012-03/31/2016	3.84	17.35	30.51	0.03	0.13	1.17	1.30	0.05	1.07	1.12	4,531.54

8/17/2010 05:01:40 PM

Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95	1,621.20
Building Vendor Trips	0.13	1.47	1.22	0.00	0.01	0.06	0.07	0.00	0.06	0.06	338.87
Building Worker Trips	0.57	1.07	18.77	0.03	0.12	0.07	0.19	0.04	0.06	0.10	2,571.48
Coating 12/01/2012-03/31/2016	0.04	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2013-12/31/2013 Active Days: 261	3.96	16.18	28.81	**0.03**	0.13	1.05	1.19	0.05	0.96	1.01	4,537.44
Building 12/01/2012-03/31/2016	3.51	16.18	28.77	0.03	0.13	1.05	1.19	0.05	0.96	1.01	4,531.25
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,621.20
Building Vendor Trips	0.12	1.30	1.12	0.00	0.01	0.05	0.06	0.00	0.05	0.05	338.88
Building Worker Trips	0.52	0.98	17.44	0.03	0.12	0.07	0.19	0.04	0.06	0.10	2,571.17
Coating 12/01/2012-03/31/2016	0.44	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2014-12/31/2014 Active Days: 261	3.66	15.02	27.21	**0.03**	0.13	0.95	1.08	0.05	0.87	0.91	4,537.20
Building 12/01/2012-03/31/2016	3.21	15.01	27.17	0.03	0.13	0.95	1.08	0.05	0.87	0.91	4,531.01
Building Off Road Diesel	2.63	12.97	9.89	0.00	0.00	0.82	0.82	0.00	0.76	0.76	1,621.20
Building Vendor Trips	0.11	1.14	1.04	0.00	0.01	0.05	0.06	0.00	0.04	0.05	338.89
Building Worker Trips	0.47	0.90	16.25	0.03	0.12	0.08	0.20	0.04	0.06	0.11	2,570.92
Coating 12/01/2012-03/31/2016	0.44	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2015-12/31/2015 Active Days: 261	3.37	13.86	25.74	**0.03**	0.13	0.88	1.01	0.05	0.80	0.85	4,536.99
Building 12/01/2012-03/31/2016	2.93	13.86	25.70	0.03	0.13	0.88	1.01	0.05	0.80	0.85	4,530.80
Building Off Road Diesel	2.40	12.04	9.62	0.00	0.00	0.76	0.76	0.00	0.70	0.70	1,621.20
Building Vendor Trips	0.10	1.00	0.95	0.00	0.01	0.04	0.05	0.00	0.04	0.04	338.91
Building Worker Trips	0.43	0.82	15.13	0.03	0.12	0.08	0.20	0.04	0.06	0.11	2,570.70
Coating 12/01/2012-03/31/2016	0.44	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19

Architectural Coating	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Time Slice 1/1/2016-3/31/2016 Active Days: 65	2.78	12.84	24.45	**0.03**	0.13	0.79	0.92	0.05	0.72	0.77	4,536.70
Building 12/01/2012-03/31/2016	2.67	12.83	24.42	0.03	0.13	0.79	0.92	0.05	0.72	0.76	4,530.50
Building Off Road Diesel	2.19	11.19	9.40	0.00	0.00	0.67	0.67	0.00	0.62	0.62	1,621.20
Building Vendor Trips	0.09	0.88	0.88	0.00	0.01	0.04	0.05	0.00	0.03	0.04	338.91
Building Worker Trips	0.39	0.76	14.13	0.03	0.12	0.08	0.20	0.04	0.06	0.11	2,570.39
Coating 12/01/2012-03/31/2016	0.11	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19
Architectural Coating	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.19

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 2/1/2012 - 7/31/2012 - Default Mass Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Graders, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Graders, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:

PM10: 50% PM25: 50%

For Graders, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

8/17/2010 05:01:40 PM

For Rubber Tired Dozers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

For Tractors/Loaders/Backhoes, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

For Water Trucks, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Water Trucks, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

For Water Trucks, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

For Off Highway Trucks, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Off Highway Trucks, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

For Off Highway Trucks, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

For Other Equipment, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Other Equipment, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

For Other Equipment, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

For Other General Industrial Equipment, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Other General Industrial Equipment, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

8/17/2010 05:01:40 PM

For Other General Industrial Equipment, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

For Scrapers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:
NOX: 15% PM10: 50% PM25: 50%

For Scrapers, the Diesel Particulate Filter (DPF) 2nd Tier mitigation reduces emissions by:
PM10: 50% PM25: 50%

For Scrapers, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:
NOX: 20%

The following mitigation measures apply to Phase: Architectural Coating 12/1/2012 - 3/31/2016 - Default Architectural Coating Description

For Residential Architectural Coating Measures, the Residential Exterior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

For Residential Architectural Coating Measures, the Residential Interior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.09	1.16	0.58	0.00	0.00	0.00	1,466.89
Hearth							
Landscape	0.60	0.05	4.18	0.00	0.01	0.01	7.04
Consumer Products	3.03						
Architectural Coatings	0.39						
TOTALS (lbs/day, unmitigated)	4.11	1.21	4.76	0.00	0.01	0.01	1,473.93

Area Source Changes to Defaults

8/17/2010 05:01:40 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	4.47	5.67	53.99	0.06	9.92	1.91	5,617.07
Estate Residential Developmet	0.50	0.42	3.83	0.00	0.74	0.14	412.94
TOTALS (lbs/day, unmitigated)	4.97	6.09	57.82	0.06	10.66	2.05	6,030.01

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	8.31	9.66	dwelling units	59.00	569.94	5,757.99
Estate Residential Developmet		1.60	1000 sq ft	30.00	48.00	427.20
					617.94	6,185.19

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	70.2	0.8	99.0	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7
Light Truck 3751-5750 lbs	10.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	5.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0

8/17/2010 05:01:40 PM

Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	64.3	35.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Estate Residential Developmet	0.0	0.0	100.0

Operational Changes to Defaults

Greenhouse Gas Emission Worksheet

Project Summary

Project: Brasada Residential Project
Project Number: 100015807

Project Totals	Tonnage		Percent of total
Construction			
Total	2957	metric tons CO2	100%
Operation			
Vehicular Use	1,018	metric tons CO2e	56%
Electricity	362	metric tons CO2e	20%
Natural Gas	266	metric tons CO2e	15%
Solid Waste	95	metric tons CO2e	5%
Water Use	91	metric tons CO2e	5%
Total	**1,832**	**metric tons CO2e**	**100%**

	Low End	*High End*
Mitigated (CAPCOA) Emissions	1,832	1,832
% Reduction	0%	0%
Mitigated (Best Performance Standards) Emissions	1,832	
% Reduction	0.00%	

	Low End	*High End*
Mitigated Emissions (Post CAPCOA and BPS)	1,832	1,832
Total % Reduction	0.00%	0.00%

Greenhouse Gas Emission Worksheet

Construction Emissions

Project: Brasada Residential Project
Project Number: 100015807 1 ton (short, US) = 0.90718474 metric ton.

Off-Road Construction Equipment

Year	Phase	tons CO2	metric tons CO2
	Demolition	9.07	8
	Mass Grading	1206.5	1095
	Trenching	21.15	19
	Paving	51.95	47
	Building Construc	1968.72	1786
	Coating	2.7	2
			0
			0
			0
			0
			0
			0
			0
			0
Total		**3260.09**	**2957**

Source: URBEMIS 2007, version 9.2.4

Greenhouse Gas Emission Worksheet
Operational Emissions

		Conversion to CO2e Units based on GWP	
Project:	Brasada Residential Project	CH4	21
Project Number:	100015807	N2O	310

Indirect Emissions from Electricity Use

Total Project Annual KWh: **1,098,000** kWH/year
Project Annual MWh: **1,098** MWH/year

1 ton (short, US) = 0.90718474 metric ton.
1 metric ton = 2,204.62 pounds

Emission Factors for Electricity Use:

CO2	724.12	lbs/MWh/year
CH4	0.0302	lbs/MWh/year
N2O	0.0081	lbs/MWh/year

Annual Emissions from Electricity Use:

	Total Emissions		**Total CO2e Units**	
CO2 emissions:	360.6444	metric tons	**360.6**	metric tons CO2e
CH4 emissions:	0.0150	metric tons	**0.3**	metric tons CO2e
N2O emissions:	0.0040	metric tons	**1.3**	metric tons CO2e
		Project Total	***362***	***metric tons CO2e***

Sources:
Table C.1 Comparison of GWPs from the IPCC's 2nd and 3rd TAR, App. C of the CCAR General Reporting Protocol (GAR), Ver. 3.1, Jan. 2009
Table C.2: CO2, CH4, and N2O Electricity Emission Factors by eGRID Subregion, Subregion CAMX, App C of the CCAR GAR, Ver. 3.1, Jan. 2009.

Emissions from Natural Gas Use

Total Project Usage: **50,105** therms/year

1 Therm = 0.1 Million Btu (MMBtu)

Emission Factors for Natural Gas Use:

CO2	11.67	lbs/therm
CH4	0.001	lbs/therm
N2O	0.00002	lbs/therm

Annual Emissions from Natural Gas Use:

	Total Emissions		**Total CO2e Units**	
CO2 emissions:	265.2294	metric tons	**265.2**	metric tons CO2e
CH4 emissions:	0.0227	metric tons	**0.5**	metric tons CO2e
N2O emissions:	0.0005	metric tons	**0.1**	metric tons CO2e
		Project Total	***266***	***metric tons CO2e***

Sources:
Table C.7: CO2 Emission Factors for Stationary Combustion, Appendix C of the CCAR GAR, Ver. 3.1, Jan. 2009
Table C.8 CH4 and N2O Emission Factors for Stationary Combustion by Fuel Type and Sector,
Appendix C of the CCAR Protocol, 2009 (for redisential, commercial, institutional uses).

Indirect Emissions from Solid Waste

Total Solid Waste: 111 tons/year
Landfill Gas: 13 tons/year

Annual Emissions from Solid Waste:

	Total Emissions		**Total CO2e Units**	
CO2 emissions:	8	tons	**7**	metric tons CO2e
CH4 emissions:	5	tons	**88**	metric tons CO2e
		Project Total	***95***	***metric tons CO2e***

Sources:
State Workbook: Methodologies for Estimating Greenhouse Gas Emissions (pages 5-1 to 5-3)

Indirect Emissions from Water Use

Indoor Uses	50.00	MG/year
Outdoor Uses*	0.00	MG/year
Total Project Usage:	50.00	MG/year
Northern or Southern Ca?	Northern	

Annual Electricity Generation Associated with Water Uses

	Water Consumption (MG)	Energy Factor MWh/MG)		
Indoor Uses	50.00	5.411	271	MWh/year
Outdoor Uses	0.00	3.5	0	MWh/year
Total Project Usage			**271**	**MWh/year**

Emission Factors for Electricity Use:

CO2	742.12	lbs/MWh/year
CH4	0.0302	lbs/MWh/year
N2O	0.0081	lbs/MWh/year

Annual Emissions from Water Use:

	Total Emissions		**Total CO2e**	**Units**
CO2 emissions:	91.1	metric tons	**91.1**	metric tons CO2e
CH4 emissions:	0.0	metric tons	**0.1**	metric tons CO2e
N2O emissions:	0.0	metric tons	**0.3**	metric tons CO2e
		Project Total	***91***	***metric tons CO2e***

* - Input manually

Sources:

Table C.5: CO2 Emission Factors and Oxidation Rates for Stationary Combustion, Appendix C of the CCAR Protocol, 2009

Table C.6 Methane and Nitrous Oxide Emission Factors for Stationary Combustion by Fuel Type, Appendix C of the CCAR Protocol, 2009.

Table ES-1: Recommended Revised Water-energy Proxies, Refining Estimates of Water-Related Energy Use in California, CEC-500-2006-118.

Greenhouse Gas Emission Worksheet

Mobile Emissions

Project: Brasada Residential Project
Project Number: 100015807

From URBEMIS 2007 Vehicle Fleet Mix Output:
Daily Vehicle Miles Traveled (VMT)*: 6458.0
Annual VMT: 2,357,170

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)	CH4 Emission (g/mile)	N2O Emission Factor (g/mile)	N2O Emission (g/mile)
Light Auto	47.5%	0.0147	0.0069825	0.0079	0.0037525
Light Truck < 3750 lbs	11.0%	0.0157	0.001727	0.0101	0.001111
Light Truck 3751-5750 lbs	22.2%	0.0157	0.0034854	0.0101	0.0022422
Med Truck 5751-8500 lbs	9.9%	0.0326	0.0032274	0.0177	0.0017523
Lite-Heavy Truck 8501-10,000 lbs	1.8%	0.0326	0.0005868	0.0177	0.0003186
Lite-Heavy Truck 10,001-14,000 lbs	0.7%	0.0326	0.0002282	0.0177	0.0001239
Med-Heavy Truck 14,001-33,000 lbs	1.1%	0.0326	0.0003586	0.0177	0.0001947
Heavy-Heavy Truck 33,001-60,000 lbs	0.9%	0.0326	0.0002934	0.0177	0.0001593
Other Bus	0.1%	0.0326	0.0000326	0.0177	0.0000177
Urban Bus	0.1%	0.0326	0.0000326	0.0177	0.0000177
Motorcycle	3.5%	0.0147	0.0005145	0.0079	0.0002765
School Bus	0.1%	0.0326	0.0000326	0.0177	0.0000177
Motor Home	1.1%	0.0326	0.0003586	0.0177	0.0001947
Total			**0.0178602**		**0.0101788**

* from URBEMIS output
1 ton (short, US) = 0.90718474 metric ton.
1g = 0.000001 metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
CO2 Emissions*:	1113.0	tons CO2	1,010	metric tons CO2e
CH4 Emissions:	0.0	metric tons CH4	1	metric tons CO2e
N20 Emissions:	0.0	metric tons N2O	7	metric tons CO2e
		Project Total:	***1,018***	***metric tons CO2e***

* Based on URBEMIS output. URBEMIS projected 6,182 VMT for the proposed project and 1,066 tons CO2. This ratio of tons of CO2 per VMT was used to calcuate the tons of CO2 that woud result from the VMT determined by the traffic engineer. 1 ton (short, US) = 0.90718474 metric ton.

Sources:
Table C.4: CH4 and N2O Emission Factors for Highway Vehicles by Model Year (g/mile),CCAR GAR, Version 3.1, January 2009.
Assume Model year 2005-present, gasoline fueled.
URBEMIS 2007, version 9.2.4.

Electricity Calcs

Project Area		*Electricity Generation Rate**		*Use*	Size/type	*Subtotal (kWH/year)*	
61	units	18,000.00	kWH/year/unit**	Single-family detached	owned	1,098,000	
	units	8,994.00	kWH/year/unit	Single-family attached	owned	-	
	units	7,348.00	kWH/year/unit	Apartments in 2-4 unit bldg	owned	-	
	units	6,959.00	kWH/year/unit	Apartments in 5+ unit bldg	owned	-	
	units	11,981.00	kWH/year/unit	Mobile homes	owned	-	
	units	11,940.00	kWH/year/unit	Single-family detached	rented	-	
	units	9,539.00	kWH/year/unit	Single-family attached	rented	-	
	units	7,495.00	kWH/year/unit	Apartments in 2-4 unit bldg	rented	-	
	units	7,008.00	kWH/year/unit	Apartments in 5+ unit bldg	rented	-	
	units	10,857.00	kWH/year/unit	Mobile homes	rented	-	
	sf	11.10	kWH/year/sf	Education	1-10k sf	-	
	sf	10.20	kWH/year/sf	Education	10k - 100k sf	-	
	sf	12.20	kWH/year/sf	Education	100k+ sf	-	
	sf	48.8	kWH/year/sf	Food sales	1-10k sf	-	
	sf	51.1	kWH/year/sf	Food sales	10k - 100k sf	-	
	sf	47.8	kWH/year/sf	Food service	1-10k sf	-	
	sf	24.5	kWH/year/sf	Food service	10k - 100k sf	-	
	sf	13.1	kWH/year/sf	Health Care	1-10k sf	-	
	sf	20.5	kWH/year/sf	Health Care	10k - 100k sf	-	
	sf	26.3	kWH/year/sf	Health Care	100k+ sf	-	
	sf	27	kWH/year/sf	Health Care (inpatient)	100k+ sf	-	
	sf	13.1	kWH/year/sf	Health Care (outpatient)	1-10k sf	-	
	sf	17.4	kWH/year/sf	Health Care (outpatient)	10k - 100k sf	-	
	sf	14	kWH/year/sf	Lodging	1-10k sf	-	
	sf	13.5	kWH/year/sf	Lodging	10k - 100k sf	-	
	sf	13.5	kWH/year/sf	Lodging	100k+ sf	-	
	sf	14.2	kWH/year/sf	Mercantile - other than retail and mall	1-10k sf	-	
	sf	19	kWH/year/sf	Mercantile - other than retail and mall	10k - 100k sf	-	
	sf	21.9	kWH/year/sf	Mercantile - other than retail and mall	100k+ sf	-	
	sf	12.2	kWH/year/sf	Retail - other than mall	1-10k sf	-	
	sf	12.9	kWH/year/sf	Retail - other than mall	10k - 100k sf	-	
	sf	21.5	kWH/year/sf	Retail - other than mall	100k+ sf	-	
	sf	19.1	kWH/year/sf	Enclosed and Strip Mall	1-10k sf	-	
	sf	23.1	kWH/year/sf	Enclosed and Strip Mall	10k - 100k sf	-	
	sf	22	kWH/year/sf	Enclosed and Strip Mall	100k+ sf	-	
	sf	12.9	kWH/year/sf	Office	1-10k sf	-	
	sf	16.4	kWH/year/sf	Office	10k - 100k sf	-	
	sf	19.9	kWH/year/sf	Office	100k+ sf	-	
	sf	11.6	kWH/year/sf	Public Assembly	1-10k sf	-	
	sf	11.2	kWH/year/sf	Public Assembly	10k - 100k sf	-	
	sf	10.4	kWH/year/sf	Public Order and Safety	1-10k sf	-	
	sf	14.9	kWH/year/sf	Public Order and Safety	10k - 100k sf	-	
	sf	4.5	kWH/year/sf	Religious Worship	1-10k sf	-	
	sf	4.7	kWH/year/sf	Religious Worship	10k - 100k sf	-	
	sf	8.2	kWH/year/sf	Service	1-10k sf	-	
	sf	10.2	kWH/year/sf	Service	10k - 100k sf	-	
	sf	5.8	kWH/year/sf	Warehouse and Storage	1-10k sf	-	
	sf	5.5	kWH/year/sf	Warehouse and Storage	10k - 100k sf	-	
	sf	10.8	kWH/year/sf	Warehouse and Storage	100k+ sf	-	
	sf	9.6	kWH/year/sf	Other	1-10k sf	-	
	sf	19.1	kWH/year/sf	Other	10k - 100k sf	-	
	sf	27.6	kWH/year/sf	Other	100k+ sf	-	
				Total		1,098,000	kWH/year

* Energy Information Administration, Office of Energy Markets and End Use, Residential Energy Consumption Survey 2005 Data Table US8 and Forms EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

****Increased energy consumption rate based on the energy consumption estimated for the proposed project by Galen T. Colley Electric in a letter dated June 18, 2010. The letter estimated an approximately 10 percent increase in yearly electricity usage for the proposed residential units compared to the average household consumption.**

Natural Gas Calcs

Project Area		*Natural Gas Usage Rate**		*Use*	*Size/type*	*Subtotal (cf/year)*
61	units	82,140.00	cf/year/unit	Single-family detached**	owned	5,010,540
	units	69,000.00	cf/year/unit	Single-family attached	owned	-
	units	66,000.00	cf/year/unit	Apartments in 2-4 unit bldg	owned	-
	units	51,000.00	cf/year/unit	Apartments in 5+ unit bldg	owned	-
	units	51,000.00	cf/year/unit	Mobile homes	owned	-
	units	67,000.00	cf/year/unit	Single-family detached	rented	-
	units	65,000.00	cf/year/unit	Single-family attached	rented	-
	units	59,000.00	cf/year/unit	Apartments in 2-4 unit bldg	rented	-
	units	40,000.00	cf/year/unit	Apartments in 5+ unit bldg	rented	-
	units	60,000.00	cf/year/unit	Mobile homes	rented	-
	sf	53.90	cf/year/sf	Education	1-10k sf	-
	sf	37.60	cf/year/sf	Education	10k - 100k sf	-
	sf	33.70	cf/year/sf	Education	100k+ sf	-
	sf	46.6	cf/year/sf	Food sales	1-10k sf	-
	sf	192.5	cf/year/sf	Food service	1-10k sf	-
	sf	77.2	cf/year/sf	Food service	10k - 100k sf	-
	sf	49.5	cf/year/sf	Health Care	1-10k sf	-
	sf	70.8	cf/year/sf	Health Care	10k - 100k sf	-
	sf	104.4	cf/year/sf	Health Care	100k+ sf	-
	sf	109	cf/year/sf	Health Care (inpatient)	100k+ sf	-
	sf	49.5	cf/year/sf	Health Care (outpatient)	1-10k sf	-
	sf	52.3	cf/year/sf	Health Care (outpatient)	10k - 100k sf	-
	sf	47.6	cf/year/sf	Lodging	10k - 100k sf	-
	sf	47.4	cf/year/sf	Lodging	100k+ sf	-
	sf	55.2	cf/year/sf	Mercantile - other than retail and m	1-10k sf	-
	sf	37.6	cf/year/sf	Mercantile - other than retail and m	10k - 100k sf	-
	sf	19.1	cf/year/sf	Mercantile - other than retail and m	100k+ sf	-
	sf	52.7	cf/year/sf	Retail - other than mall	1-10k sf	-
	sf	27.7	cf/year/sf	Retail - other than mall	10k - 100k sf	-
	sf	15.7	cf/year/sf	Retail - other than mall	100k+ sf	-
	sf	60	cf/year/sf	Enclosed and Strip Mall	1-10k sf	-
	sf	44	cf/year/sf	Enclosed and Strip Mall	10k - 100k sf	-
	sf	20.1	cf/year/sf	Enclosed and Strip Mall	100k+ sf	-
	sf	42.4	cf/year/sf	Office	1-10k sf	-
	sf	36.7	cf/year/sf	Office	10k - 100k sf	-
	sf	23.7	cf/year/sf	Office	100k+ sf	-
	sf	41.5	cf/year/sf	Public Assembly	1-10k sf	-
	sf	42.5	cf/year/sf	Public Assembly	10k - 100k sf	-
	sf	42.7	cf/year/sf	Religious Worship	1-10k sf	-
	sf	27.7	cf/year/sf	Religious Worship	10k - 100k sf	-
	sf	69.8	cf/year/sf	Service	1-10k sf	-
	sf	50.7	cf/year/sf	Service	10k - 100k sf	-
	sf	34.2	cf/year/sf	Warehouse and Storage	1-10k sf	-
	sf	26	cf/year/sf	Warehouse and Storage	10k - 100k sf	-
	sf	18.4	cf/year/sf	Warehouse and Storage	100k+ sf	-
	sf	91.1	cf/year/sf	Other	10k - 100k sf	-
				Total		5,010,540 cf/year
						or
						50,105.40 therms/year

* Energy Information Administration, Office of Energy Markets and End Use, Residential Energy Consumption Survey 2005 Data Table US8 and Forms EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

**Increased natural gas consumption rate based on the energy consumption estimated for the proposed project by Galen T. Colley Electric in a letter dated June 18, 2010. The letter estimated an approximately 11 percent increase in yearly electricity usage for the proposed residential units compared to the average household consumption. The 11 percent increase was also applied to natural gas consumption.

Solid Waste Calcs

Project Area		*Solid Waste Generation Rate**		*Use*	*Subtotal (tons/year)*
	sf	0.01	lbs/sf/day	Office	-
	sf	0.025	lbs/sf/day	Shopping Center	-
	sf	0.0312	lbs/sf/day	Department Store	-
	sf	0.0142	lbs/sf/day	Manufacturing/warehouse	-
	sf	0.007	lbs/sf/day	School	-
	beds	16	lbs/bed/day	Hospital	-
61	unit	10	lbs/unit/day	Single-family Residential	111
	unit	4	lbs/unit/day	Multi-family Residential	-
				Total	111 tons/year

* CIWMB Estimate Solid Waste Generation Rates (use other rates as appropriate)

Water Calcs

Project	*Units*	*Water (gals/day/unit)*	*Water Usage (gals/day)*	*Type Description*	*Annual Water Usage (Million Gallons)*
				Residential	
61	Parcel	299	18239	Single Family Home	6.657235
	Parcel	358.8	0	Duplex	0
	Parcel	538.2	0	Triplex	0
	Parcel	717.6	0	Fourplex	0
	Parcel	224.25	0	Condominiums	0
	Parcel	179.4	0	Single Family Home (reduced rate)	0
	# of Units	179.4	0	Five Units or More	0
	# of Space	179.4	0	Mobile Home Park	0
				Commercial	
	Room	143.75	0	Hotel/Motel/Rooming House	0
	1000 sq. ft	115	0	Store	0
	1000 sq. ft	172.5	0	Supermarket	0
	1000 sq. ft	373.75	0	Shopping Center	0
	1000 sq. ft	172.5	0	Regional Mall	0
	1000 sq. ft	230	0	Office Building	0
	1000 sq. ft	345	0	Professional Building	0
	1000 sq. ft	1150	0	Restaurant	0
	1000 sq. ft	143.75	0	Indoor Theater	0
	1000 sq. ft	4255	0	Car Wash - Tunnel - No Recycling	0
	1000 sq. ft	3105	0	Car Wash - Tunnel - Recycling	0
	1000 sq. ft	805	0	Car Wash - Wand	0
	1000 sq. ft	115	0	Financial Institution	0
	1000 sq. ft	115	0	Service Shop	0
	1000 sq. ft	115	0	Animal Kennels	0
	1000 sq. ft	115	0	Service Station	0
	1000 sq. ft	115	0	Auto Sales/Repair	0
	1000 sq. ft	115	0	Wholesale Outlet	0
	1000 sq. ft	28.75	0	Nursery/Greenhouse	0
	1000 sq. ft	230	0	Manufacturing	0
	1000 sq. ft	28.75	0	Dry Manufacturing	0
	1000 sq. ft	28.75	0	Lumber Yard	0
	1000 sq. ft	28.75	0	Warehousing	0
	1000 sq. ft	28.75	0	Open Storage	0
	1000 sq. ft	23	0	Drive-in Theater	0
	1000 sq. ft	402.5	0	Night Club	0
	1000 sq. ft	172.5	0	Bowling/Skating	0
	1000 sq. ft	143.75	0	Club	0
	1000 sq. ft	402.5	0	Auditorium/Amusement	0
	1000 sq. ft	115	0	Golf Course, Camp, and Park (Structures and Improvements)	0
	# of spaces	63.25	0	Recreational Vehicle Park	0
	Bed	143.75	0	Convalescent Home	0
	1000 sq. ft	4398.75	0	Laundry	0
	1000 sq. ft	115	0	Mortuary/Cemetery	0
	1000 sq. ft	690	0	Health Spa Gymnasium - With Showers	0
	1000 sq. ft	345	0	Health Spa Gymnasium - Without Showers	0
	Average A	11.5	0	Convention Center, Fairground, Fairground, Racetrack, Stadium	0
				Institutional	
	Student	23	0	College/University	0
	1000 sq. ft	230	0	Private School	0
	1000 sq. ft	57.5	0	Church	0
	Total		*0*		**6.66** MG water (annual)

* Derived from County of Los Angeles Bureau of Sanitation Sewer Generation Factors. Water consumption assumed to be 115% of sewer gen