

## 4.3 AIR QUALITY

The project would be consistent with federal, State, and BAAQMD regulations pertaining to emissions of air pollutants, as well as air quality policies related to residential development in the City of Antioch's General Plan.

Projected air quality resulting from occupation of the project area (in 2015) would not violate air quality standards for carbon monoxide emissions, the greatest pollutant concern at the local level.

Although mitigation measures are expected to further reduce emissions from project build-out, emissions of reactive organic gas (ROG), which are mostly produced by consumer products, and PM<sub>10</sub> would continue to be above the significance thresholds.

Dust and equipment exhaust caused by construction activities have the potential to impact sensitive receptors (people particularly susceptible to the adverse effects of air pollution). Mitigation measures have been included to reduce this impact to a less than significant level.

The project's potential cumulative impact to global climate change is discussed in Chapter 6.0. The impact is considered to be potentially significant and unavoidable, although a quantitative threshold has not been established yet by the state.

This section evaluates the air quality impacts associated with construction and operation of the proposed project. The primary focus of the air quality study was to evaluate future project-related emissions on regional and local air quality as well as existing sources of air pollution near the project that could affect "sensitive receptors," specifically, new residents on the project site.

### 4.3.1 EXISTING SETTING

#### Existing Conditions

##### **Physical Setting**

The project site is located in eastern Contra Costa County, east of the Diablo Range. The San Joaquin River and Delta lie to the north of the site and hilly terrain lies to the south. East of the project site is the northern extent of the San Joaquin Valley. The mountains to the west and southwest block the direct flow of marine air into the area.

Climate of the area is characterized by hot and dry summers with clear skies and mild to cool winters with periodic rainfall events and radiation fog. A semipermanent high pressure system over the eastern Pacific Ocean results in subsiding air (sinking air) that provides dry conditions with clear skies. Intense solar radiation in late spring and summer result in warm to hot weather conditions in this portion of the Bay Area. Moist Pacific air trapped below the marine inversion (resulting from subsiding air under high pressure) travels inland moderating temperatures on most days. When a strong high pressure develops over the region in late spring and summer, the resulting warm conditions and a weak or non-existent marine inversion create clear skies and relatively

stable atmospheric conditions.

In the winter, high pressure over the eastern Pacific weakens and generally shifts south, allowing transitional weather systems associated with the polar jet stream to affect northern and central California on a regular basis. These systems include both transitory high and low pressure systems. The high pressure systems can result in clear skies with cold temperatures and strong radiation inversions that trap air very close to the surface. This results in stagnant conditions that result in the development of morning fog. Fog development in the San Joaquin Valley can move into the area under these conditions, which can result in persistent foggy conditions. Low pressure systems are usually associated with cold fronts that produce rain and moderate to strong winds. The site lies in the rain shadow of the coastal hills. Rainfall in the area is about 15 inches, while mountains just west of the site receive about 30 inches.

Wind flow in the region is generally from the west-southwest, associated with the normal westerly flow through the Bay and Delta. Strong southerly winds can develop during fall, winter and early spring when low pressure systems track through the area. Gusty afternoon winds are common in late spring and early summer as marine air is squeezed through valleys and the delta. Winds tend to be the lightest and most variable in late fall and early winter when strong surface-based inversions tend to decouple the lowest levels of the atmosphere.

#### **Criteria Air Pollutants and Effects**

Air quality studies generally focus on five pollutants that are most commonly measured and regulated: carbon monoxide (CO), ground level ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and suspended particulate matter, i.e., PM<sub>10</sub> and PM<sub>2.5</sub>, as listed in **Table 4.3-1**. In Contra Costa County, ozone and particulate matter are the pollutants of greatest concern, as measured air pollutant levels exceed these concentrations at times.

#### **Toxic Air Contaminants**

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter and benzene near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level. Diesel exhaust is the predominant TAC in urban air, and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). Diesel exhaust is a complex mixture of gases, vapors, and fine particles, which makes the evaluation of its health effects a complex scientific issue. The California Air Resources Board (CARB) previously identified some of the chemicals in diesel exhaust (e.g., benzene, formaldehyde) as TACs; they are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants program. California has adopted a comprehensive diesel risk-reduction program. U.S. EPA has adopted low-sulfur diesel fuel standards that will reduce diesel particulate matter substantially; these standards went into effect in late 2006.

Table 4.3-1 Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Carbon Monoxide (CO)	Non-reactive, colorless and odorless gas that dissipates relatively quickly; ambient CO concentrations generally located near vehicular traffic Highest CO concentrations measured in the Bay Area are typically recorded during the winter	Interferes with the transfer of oxygen to the brain; causes dizziness and fatigue; can impair central nervous system functions	Automobile exhaust, residential wood burning in fireplaces and woodstoves
Ozone (O <sub>3</sub> )	Colorless toxic gas and the chief component of urban smog Present in relatively high concentrations within portions of the Bay Area; highest concentrations occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies	Irritates eyes; impairs respiratory function; interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen	Although not directly emitted from a particular source, it forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and nitrogen oxides (NO <sub>x</sub> ) under sunlight; ROG and NO <sub>x</sub> are primarily emitted from automobiles, and industrial sources
Nitrogen Dioxide (NO <sub>x</sub> )	Reddish-brown gas that irritates the lungs; NO and NO <sub>2</sub> are collectively referred to as NO <sub>x</sub> and are major contributors to O <sub>3</sub> formation; NO <sub>2</sub> also contributes to the formation of PM <sub>10</sub> Levels of NO <sub>2</sub> in the Bay Area are relatively low	Irritates lungs; can cause breathing difficulties at high concentrations	Like O <sub>3</sub> , NO <sub>2</sub> is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen; NO is primarily emitted from automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants
Sulfur Oxides (SO <sub>x</sub> )	Primarily SO <sub>2</sub> , sulfur oxides are colorless gases with a pungent, irritating odor Due to the lack of sources, levels of SO <sub>2</sub> in the Bay Area are relatively low.	Increases risk of acute and chronic respiratory disease; can cause diminished ventilator function in children	Product of high-sulfur fuel combustion from coal and oil used in power stations, industries, and for domestic heating; industrial chemical manufacturing; diesel vehicle exhaust
Suspended Particulate Matter (PM <sub>2.5</sub> / PM <sub>10</sub> )	Very small liquid and solid particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals; can produce haze and reduce regional visibility <i>PM<sub>10</sub></i> : Particulate matter less than 10 microns in diameter, about one-seventh the thickness of a human hair <i>PM<sub>2.5</sub></i> : Particulate matter 2.5 microns or less in diameter	Damages respiratory tract; increases the number and severity of asthma attacks; causes or aggravates bronchitis and other lung diseases; reduces the body's ability to fight infections	Motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; atmospheric chemical and photochemical reactions

Source: Illingworth & Rodkin, Inc.

In cooler weather, smoke from residential wood combustion can be a source of TACs. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind, the pollution can persist for many hours. This occurs in sheltered valleys during the winter. Wood smoke also contains a significant amount of PM<sub>10</sub> and PM<sub>2.5</sub>. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

ARB data indicate that the cancer health risk from air toxic contaminants in Antioch is less than 250 in 1 million, while the risk in the most urbanized areas of the Bay Area exceeds 1,000 in 1 million. Population weighted cancer risk in the Bay Area is just under 500 in 1 million. This risk is expected to decrease substantially in the future.

### **Ambient Air Quality Conditions**

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard. The standards represent the allowable pollutant concentrations designed to ensure that public health and welfare are protected, while including a reasonable margin of safety to protect the more sensitive individuals in the population.

### **Air Pollution Potential**

Antioch's typical summer weather conditions (clear skies with relatively warm temperatures) combine with localized air pollutant emissions to elevate O<sub>3</sub> levels. Air quality standards for O<sub>3</sub> traditionally are exceeded when relatively stagnant conditions occur for periods of several days during the warmer months of the year. Weak wind flow patterns combined with strong inversions substantially reduce normal atmospheric mixing. Key components of ground-level O<sub>3</sub> formation are sunlight and heat; thus, significant O<sub>3</sub> formation only occurs from late spring through early fall. Air pollution potential in the project area is higher than other parts of the Bay Area because winds generally transport O<sub>3</sub> precursor pollutants into the area. Highest concentrations of O<sub>3</sub> occur at monitoring stations in the eastern and southern portions of the Bay Area, because they are usually downwind of the major urban areas. Light winds that are common in winter combine with strong surface-based inversions caused by cold air trapped near the surface, to trap pollutants such as particulates (e.g., wood smoke) and CO. This can lead to localized high concentrations of these pollutants.

### **Air Monitoring Data**

The Bay Area Air Quality Management District (BAAQMD) monitors air quality conditions at over 30 locations throughout the Bay Area. The Pittsburg air monitoring station is the nearest station to Antioch, and thus is the most representative of air quality conditions at the project area. Criteria pollutants monitored include O<sub>3</sub>, CO, NO<sub>2</sub>, hydrocarbons, PM<sub>10</sub>, and PM<sub>2.5</sub>. The gaseous pollutants (i.e., O<sub>3</sub>, CO, and NO<sub>2</sub>) are monitored continuously,

while particulate matter is sampled for 24 hours every sixth day. A summary of the data recorded at this station is shown in **Table 4.3-2** for the period 2003 through 2007. The State and federal ambient air quality standards, for which this air monitoring station data can be compared, are presented in **Table 4.3-3**.

**Table 4.3-4** shows the number of days per year that air pollutant levels exceeded national or State standards in Pittsburg and the entire Bay Area monitoring network. The National Ambient Air Quality Standards (NAAQS) for O<sub>3</sub> (8-hour concentrations) was exceeded once in 2006. No other exceedances of the NAAQS for O<sub>3</sub> have occurred at this station. The 1-hour California Ambient Air Quality Standards (CAAQS) for O<sub>3</sub> was exceeded on three days in 2006 during a heat wave and one day in 2007. Exceedances of that standard did not occur in 2003 through 2005. The new State 8-hour O<sub>3</sub> standard was exceeded on two days in 2005, 10 days in 2006 and two days in 2007. Measured concentrations of CO and NO<sub>2</sub> did not exceed the NAAQS or CAAQS. Measured exceedances of the 24-hour PM<sub>10</sub> State standard occurred on one to three sampling days annually during the five-year period. PM<sub>2.5</sub> is not measured at this station.

Data from all stations throughout the Bay Area indicate that the 1-hour NAAQS for O<sub>3</sub> concentrations (revoked in 2005) was exceeded on zero to three days annually. The 8-hour NAAQS for O<sub>3</sub> was exceeded zero to 12 days annually. The more stringent State 1-hour O<sub>3</sub> standard was exceeded on seven to 19 days annually and the new State 8-hour standard was exceeded on nine to 22 days annually. The State PM<sub>10</sub> standard was exceeded on six to 15 sampling days annually. The new 2006 PM<sub>2.5</sub> national standard was exceeded on 10 days in 2006 and 14 days in 2007.

#### **Attainment Status for State and Federal Ambient Air Quality Standards**

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The Bay Area as a whole does not meet either CAAQS or NAAQS for ground level O<sub>3</sub>, or CAAQS for fine particulate matter. For O<sub>3</sub>, the entire Bay Area is designated as non-attainment at both the federal and State levels.

Under the federal Clean Air Act (CAA), the EPA has designated the region as marginally non-attainment for the 8-hour O<sub>3</sub> standard. EPA recently revised the standard slightly and will be making new attainment designations for this standard in about three years.

In order to address EPA planning requirements for the Bay Area, BAAQMD may submit a maintenance plan and demonstration with a request for redesignation to "attainment" since the U.S. EPA has made a determination that the area has met the 8-hour O<sub>3</sub> standard. However, BAAQMD is continuing to monitoring the attainment of this standard prior to making a formal redesignation request. The area was required to meet the 1997 standard by June 2007, and recent monitoring data indicate that the region is meeting this attainment goal.

Table 4.3-2 Highest Measured Air Pollutant Concentrations (2003-2007)

Pollutant	Average Time	Measured Air Pollutant Levels				
		2003	2004	2005	2006	2007
<b>Pittsburg</b>						
Ozone (O <sub>3</sub> )	1-Hour <sup>a</sup>	0.09 ppm	0.09 ppm	0.09 ppm	<b>0.011 ppm</b>	<b>0.10 ppm</b>
	8-Hour	0.08 ppm	0.08 ppm	0.08 ppm	<b>0.09 ppm</b>	0.07 ppm
Carbon Monoxide (CO)	8-Hour	1.7 ppm	1.9 ppm	1.7 ppm	1.9 ppm	1.5 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	1-Hour	0.06 ppm	0.05 ppm	0.06 ppm	0.05 ppm	0.05 ppm
	Annual	0.01 ppm	0.01 ppm	0.01 ppm	0.01 ppm	0.01 ppm
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	NA	NA	NA	NA	NA
	Annual	NA	NA	NA	NA	NA
Respirable Particulate Matter (PM <sub>10</sub> )	24-Hour	<b>58 µg/m<sup>3</sup></b>	<b>64 µg/m<sup>3</sup></b>	<b>57 µg/m<sup>3</sup></b>	<b>59 µg/m<sup>3</sup></b>	<b>59 µg/m<sup>3</sup></b>
	Annual	NA	<b>22 µg/m<sup>3</sup></b>	NA	20 µg/m <sup>3</sup>	19 µg/m <sup>3</sup>
<b>Bay Area (Basin Summary)</b>						
Ozone (O <sub>3</sub> )	1-Hour	<b>0.12 ppm</b>	<b>0.11 ppm</b>	<b>0.12 ppm</b>	<b>0.12 ppm</b>	<b>0.12 ppm</b>
	8-Hour	<b>0.10 ppm</b>	<b>0.08 ppm</b>	<b>0.09 ppm</b>	<b>0.11 ppm</b>	<b>0.09 ppm</b>
Carbon Monoxide (CO)	8-Hour	4.0 ppm	3.4 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	1-Hour	0.09 ppm	0.07 ppm	0.07 ppm	0.11 ppm	0.07 ppm
	Annual	0.021 ppm	0.019 ppm	0.019 ppm	0.018 ppm	0.017 ppm
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	<b>60 µg/m<sup>3</sup></b>	<b>65 µg/m<sup>3</sup></b>	<b>81 µg/m<sup>3</sup></b>	<b>73 µg/m<sup>3</sup></b>	<b>78 µg/m<sup>3</sup></b>
	Annual	<b>25 µg/m<sup>3</sup></b>	<b>26 µg/m<sup>3</sup></b>	<b>24 µg/m<sup>3</sup></b>	<b>23 µg/m<sup>3</sup></b>	<b>26 µg/m<sup>3</sup></b>
Respirable Particulate Matter (PM <sub>10</sub> )	24-Hour	<b>56 µg/m<sup>3</sup></b>	<b>52 µg/m<sup>3</sup></b>	<b>55 µg/m<sup>3</sup></b>	<b>75 µg/m<sup>3</sup></b>	<b>58 µg/m<sup>3</sup></b>
	Annual	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>	11 µg/m <sup>3</sup>	11 µg/m <sup>3</sup>

Sources: BAAQMD – Bay Area Air Pollution Summaries 2000-2004 and ARB for 2005.

<sup>a</sup> Although the federal 1-hour ozone standard has been revoked, California continues to apply its own 1-hour standard.

Notes: ppm = parts per million  
µg/m<sup>3</sup> = micrograms per cubic meter  
Values reported in bold exceed ambient air quality standard  
NA = data not available.

Table 4.3-3 California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards <sup>a</sup>	
			Primary <sup>b</sup>	Secondary <sup>c</sup>
Ozone	8-hour	0.070 ppm (154 µg/m <sup>3</sup> )	0.075 ppm (165µg/m <sup>3</sup> )	—
	1-hour	0.09 ppm (180 µg/m <sup>3</sup> )	— <sup>d</sup>	Same as primary
Carbon monoxide	8-hour	9.0 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )	—
	1-hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )	—
Nitrogen dioxide	Annual	0.030 ppm (57 µg/m <sup>3</sup> )	0.053 ppm (100 µg/m <sup>3</sup> )	Same as primary
	1-hour	0.25 ppm	—	—
Sulfur dioxide	Annual	—	0.03 ppm (80 µg/m <sup>3</sup> )	—
	24-hour	0.04 ppm (105 µg/m <sup>3</sup> )	0.14 ppm (365 µg/m <sup>3</sup> )	—
	3-hour	—	—	0.5 ppm (1,300 µg/m <sup>3</sup> )
	1-hour	0.25 ppm (655 µg/m <sup>3</sup> )	—	—
PM <sub>10</sub>	Annual	20 µg/m <sup>3</sup>	— <sup>e</sup>	Same as primary
	24-hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	Same as primary
PM <sub>2.5</sub>	Annual	12 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	—
	24-hour	—	35 µg/m <sup>3</sup>	—
Lead	Calendar quarter	—	1.5 µg/m <sup>3</sup>	Same as primary
	30-day average	1.5 µg/m <sup>3</sup>	—	—

Source: <http://www.arb.ca.gov/aqs/aaqs2.pdf>.

<sup>a</sup> Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The 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.

Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

<sup>b</sup> **Primary Standards:** The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.

<sup>c</sup> **Secondary Standards:** The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

<sup>d</sup> The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. A new 8-hour standard was established in May 2008.

<sup>e</sup> The annual PM<sub>10</sub> standard was revoked by U.S. EPA on September 21, 2006 and a new PM<sub>2.5</sub> 24-hour standard was established.

Notes: ppm= parts per million  
µg/m<sup>3</sup> = micrograms per cubic meter

Table 4.3-4 Number of Days Measured Air Quality Levels Exceeded Standards

Pollutant	Standard	Monitoring Station	Days Exceeding Standard				
			2003	2004	2005	2006	2007
Ozone (O <sub>3</sub> )	NAAQS 1-hr	Pittsburg	0	0	–	–	–
		BAY AREA	1	0	–	–	–
	NAAQS 8-hr	Pittsburg	0	0	0	1	0
		BAY AREA	7	0	1	12	1
	CAAQS 1-hr	Pittsburg	0	0	0	3	1
		BAY AREA	19	7	9	18	4
	CAAQS 8-hr	Pittsburg	–	–	2	10	2
		BAY AREA	–	–	9	22	9
Fine Particulate Matter (PM <sub>10</sub> )	NAAQS 24-hr	Pittsburg	0	0	0	0	0
		BAY AREA	0	0	0	0	0
	CAAQS 24-hr	Pittsburg	1	1	1	2	4
		BAY AREA	6	7	3	15	4
Fine Particulate Matter (PM <sub>2.5</sub> )	NAAQS 24-hr	Pittsburg	–	–	–	–	–
		BAY AREA	0	1	–	10	14
All Other (CO, NO <sub>2</sub> , Lead, SO <sub>2</sub> )	All Other	Pittsburg	0	0	0	0	0
		BAY AREA	0	0	0	0	0

Sources: [http://www.baaqmd.gov/pio/air\\_quality\\_summaries/index.htm](http://www.baaqmd.gov/pio/air_quality_summaries/index.htm) and <http://www.arb.ca.gov/adam/welcome.html>.

The Bay Area has met the federal CO standards for over a decade and is classified as attainment by the EPA. The EPA grades the region as unclassified for all other air pollutants, which include PM<sub>10</sub> and PM<sub>2.5</sub>. An unclassified designation means that there is not enough data to designate an area as “nonattainment,” but the area likely is in attainment of the standard. There have not been any violations of these standards; however, the new 2006 PM<sub>2.5</sub> standard is exceeded in portions of the Bay Area. The EPA will reclassify air basins as attainment, nonattainment, or unclassified for PM<sub>2.5</sub> in late 2009 after collection of three years of data.

At the State level, the region is considered serious non-attainment for ground level O<sub>3</sub> and non-attainment for PM<sub>10</sub> and PM<sub>2.5</sub>. The region is required to adopt plans on a triennial basis that show progress towards meeting the State O<sub>3</sub> standard (see Air Quality plans, discussed under Regulatory Setting). The area is considered attainment or unclassified for all other pollutants.

### Sensitive Receptors

Sensitive receptors are individuals who are particularly susceptible to the adverse effects of air pollution. CARB has identified sensitive receptors: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. Both State and national ambient air quality standards were developed with the intent to protect sensitive receptors from the adverse impacts of air pollution.

## **Greenhouse Gas Emissions**

Gases that trap heat in the atmosphere are called greenhouse gases (GHG). Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. Greenhouse gases, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the greenhouse effect. The greenhouse effect, maintains a habitable climate. Greenhouse gases are emitted by natural processes and human activities. Emissions from human activities, such as electricity production, motor vehicle use, and agriculture are elevating the concentration of GHGs in the atmosphere, and are reported to have led to a trend of unnatural warming of the earth's natural climate, known as global warming or climate change. Other than water vapor, the GHGs contributing to global warming include the following gases:

- Carbon dioxide, primarily a byproduct of fuel combustion
- Nitrous oxide, a byproduct of fuel combustion and also associated with agricultural operations such as fertilization of crops
- Methane, commonly created by off gassing from agricultural practices (e.g., keeping livestock) and landfill operation
- Chlorofluorocarbons, widely used as refrigerants, propellants and cleaning solvents,; their production has been mostly reduced by international treaty
- Hydrofluorocarbons, now used as a substitute for chlorofluorocarbons in refrigeration and cooling
- Perfluorocarbons and sulfur hexafluoride emissions, commonly created by industries such as aluminum production and semiconductor manufacturing

The State of California is concerned about GHG emissions and their effect on global climate change. Extensive research on the effect of human activity on global climate has and continues to occur. Many studies have identified the link between emissions of GHG and rising global temperatures, finding overwhelming evidence that human activity is causing global warming.<sup>1</sup> Impacts to California from this climate change could include reduced snow pack, increased risk of large wildfires, increased flooding potential, and reductions in the quality and quantity of agricultural products.

In 2006, the governor of California signed AB 32, the Global Warming Solutions Act, into legislation. The Act requires that California cap its greenhouse gas emissions at 1990 levels by 2020. This legislation requires the CARB to establish a program for statewide greenhouse gas emissions reporting and monitoring/enforcement of that program. CARB recently published a list of discrete greenhouse gas emissions reduction measures that can

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<sup>1</sup> United Nations Intergovernmental Panel on Climate Change (IPCC), 2007.

be implemented immediately. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions. CARB's Early Action Plan identified regulations and measures that could be implemented in the near future to reduce GHG emissions.

California emissions of GHG or CO<sub>2</sub> equivalent emissions were estimated at 484 million metric tons of equivalent CO<sub>2</sub> emissions (MMTCO<sub>2</sub>e), which is about 7 percent of the emissions from the entire United States. It is estimated that the United States contributes up to 35 percent of the world's CO<sub>2</sub> equivalent emissions. Transportation is the largest source of GHG emissions in California, contributing about 40 percent of the emissions. Electricity generation is second at over 20 percent, but California does import electricity during the summer, bringing energy sources up to about 25 percent. Industrial activities account for about 20 percent of the State's emissions. Under a "business as usual" scenario, emissions of GHG are estimated to increase to approximately 600 MMTCO<sub>2</sub>e. CARB staff has estimated the 1990 statewide emissions level to be 427 MMTCO<sub>2</sub>e; therefore, requiring a reduction of almost 30 percent in emissions by 2020 to meet the AB32 goal.

In 2002, Contra Costa County emitted approximately 25.6 million tons of CO<sub>2</sub>e from industrial, commercial, transportation, domestic, forestry and agricultural activities. Contra Costa County was responsible for 30 percent of CO<sub>2</sub>e emissions for the entire nine-county Bay Area. The breakdown of emissions by major source categories within Contra Costa County showed that approximately 55 percent of emissions were from point sources. Electric power generating plants and oil refineries are examples of point sources, and the BAAQMD maintains a computer database with detailed information on operations and emission characteristics for nearly 4,000 facilities including approximately 25,000 different sources. Another 20 percent were from area sources, and 25 percent were from mobile sources. Area sources are groups of numerous small emission sources, which individually do not emit significant amounts of pollutants, but together make an appreciable contribution to the emission inventory. Many area sources do not require permits from the BAAQMD to operate, such as residential heating, restaurants, and a wide-range of consumer products such as paints, solvents, and cleaners. Some area source facilities do require permits from the BAAQMD, such as gas stations and dry cleaners. Emissions estimates from area sources are developed based on estimated activities and emission factors for various categories. Mobile sources consist of on-road motor vehicles and other mobile sources such as boats, ships, trains, aircraft, and garden, farm, and construction equipment. GHG emissions for on-road motor vehicles were obtained from CARBS EMFAC2002 model. Other mobile source emissions were calculated based on emission factors.

Many of the measures to reduce GHG emissions from transportation will come from CARB. AP 1493, the Paveley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. CARB's AB32 Early Action Plan released in 2007 included a strengthening of the Paveley regulation for 2017 and included a commitment to develop a Low Carbon Fuel Standard (LCFS). Current projections indicate that with implementation of a strengthened Pavley Regulations, including LCFS, California will still

fall short of the 1990 level targets for transportation emission reductions. A recent denial of waiver to implement a LCFS by the U.S. EPA and pending legal challenges by the automotive industry could further complicate the schedule to achieve emission reduction targets. CARB is considering additional actions to reduce mobile source emissions that will be released in late 2008.

CARB is targeting other sources of emissions. The main measures to reduce GHG emissions will be contained in the AB32 Scoping Plan. A draft of that plan was released in June 2008. This draft plan includes a range of GHG reduction actions. Central to the draft plan is a cap and trade program covering 85 percent of the State's emissions. This program will be developed in conjunction with the Western Climate Initiative, comprised of seven states and three Canadian provinces, to create a regional carbon market. The draft plan also proposes that utilities produce a third of their energy from renewable sources such as wind, solar, and geothermal, and proposes to expand and strengthen existing energy efficiency programs and building and appliance standards. The draft plan also includes full implementation of the Paveley standards to provide a wide range of less polluting and more efficient cars and trucks to consumers who will save on operating costs and reduced fuel use. It also calls for development and implementation of the Low Carbon Fuel Standard, which will require oil companies to make cleaner, domestically produced fuels. A final draft of the plan was released on October 15, 2008 and approved at the CARB hearing on December 11, 2008.

Pursuant to Senate Bill 97, the Governor's Office of Planning and Research (OPR) is in the process of developing CEQA guidelines addressing GHGs. OPR is required to "prepare, develop, and transmit" the guidelines to the Resources Agency on or before July 1, 2009. In June 2008, OPR issued interim guidance for addressing climate change through CEQA. OPR recommends that each agency develop an approach to addressing GHG emissions that is based on best available information.

The approach includes three basic steps:

- (1) identify and quantify emissions;
- (2) assess the significance of these emissions;
- (3) if emissions are significant, identify mitigation measures or alternatives that will reduce the impact to a less than significant level.

At this time, both the City of Antioch and the BAAQMD have not identified a significance threshold for GHG emissions.

## Regulatory Setting

### **Bay Area Air Quality Management District**

BAAQMD is primarily responsible for assuring that the national and State ambient air quality standards are attained and maintained in the Bay Area.

### *Air Quality Plans*

Air quality plans addressing the California Clean Air Act were developed in 1991 and updated about every three years to demonstrate progress toward meeting the more stringent 1-hour ozone CAAQS. In early 2006, BAAQMD adopted the Bay Area 2005 Ozone Strategy, which includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. This plan replaced the 2000 Clean Air Plan and proposed implementation of transportation control measures to address the 1-hour NAAQS for O<sub>3</sub> and achieve region-wide reductions in O<sub>3</sub> precursor pollutants. Although the U.S. EPA revoked the 1-hour O<sub>3</sub> NAAQS, commitments made in that plan, along with emissions budgets, remain valid until the region develops an attainment demonstration/maintenance plan for the 8-hour NAAQS for O<sub>3</sub>. The region will be required to submit a maintenance plan and demonstration of attainment with a request for redesignation to the EPA when the 8-hour O<sub>3</sub> NAAQS is met. A Carbon Monoxide Maintenance Plan was approved in 1998 by the EPA, which demonstrated how NAAQS for CO standard would be maintained.

### *BAAQMD Regulations*

The Bay Area 2005 Ozone Strategy proposes expanded implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation. The clean air planning efforts for ozone also will reduce PM<sub>10</sub> and PM<sub>2.5</sub>, as a substantial amount of particulate matter comes from combustion emissions such as vehicle exhaust.

BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions (e.g., Spare the Night Program). California Senate Bill 656 (SB 656) requires further action by CARB and air districts to reduce public exposure to PM<sub>10</sub> and PM<sub>2.5</sub>. Efforts identified by BAAQMD in response to SB656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NO<sub>x</sub> and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities. The Bay Area experiences the highest PM<sub>10</sub> and PM<sub>2.5</sub> in winter when wood smoke and ammonium nitrate contributions to particulate matter are highest. Currently, BAAQMD is proposing a rule to restrict operation of any indoor or outdoor fireplace, fire pit, wood or pellet stove, masonry heater or fireplace insert on specific days during the winter when air quality conditions are forecasted to exceed the NAAQS for PM<sub>2.5</sub>. The proposed rule also would limit excess visible emissions from wood burning devices and require clean burning technology for wood burning devices sold (or resold) or installed in the Bay Area. NO<sub>x</sub> emissions contribute to ammonium nitrate formation that resides in the atmosphere as particulate matter, so a reduction in NO<sub>x</sub> emissions would reduce wintertime PM<sub>2.5</sub> levels.

### **National and State Ambient Air Quality Standards**

As required by the Federal CAA, NAAQS have been established for six major air pollutants: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), ozone (O<sub>3</sub>), respirable particulate matter (PM<sub>10</sub>), fine particulate matter (PM<sub>2.5</sub>), sulfur oxides (SO<sub>x</sub>), and lead. Pursuant to the California CAA, the State of California also has established ambient air quality standards (CAAQS). These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. Both State and federal standards are summarized in **Table 4.3-3**. The “primary” standards have been established to protect the public health. The “secondary” standards are intended to protect the nation’s welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare. Thus, CAAQS are used as the comparative standard in this analysis. Both the State and federal ambient air quality standards have been adopted by BAAQMD.

### **City of Antioch General Plan**

The City of Antioch General Plan contains numerous objectives and polices designed to implement its vision related to air quality. The applicable policies of the General Plan relating to air quality for residential development are listed below and will apply at the time of project-level applications. These policies govern regulations and enforcement of construction, mobile, and stationary emissions that may occur from new development.

- Policy 10.6.2a      Require development projects to minimize the generation of particulate emissions during construction through implementation of the dust abatement actions outlined in the CEQA Handbook of the Bay Area Air Quality Management District.
- Policy 10.6.2b      Require developers of large residential and non-residential projects to participate in programs and to take measures to improve traffic flow and/or reduce vehicle trips resulting in decreased vehicular emissions. Examples of such efforts may include, but are not limited to the following.
- Development of mixed-use projects, facilitating pedestrian and bicycle transportation and permitting consolidation of vehicular trips.
  - Installation of transit improvements and amenities, including dedicated bus turnouts and sufficient rights-of-way for transit movement, bus shelters, and pedestrian easy access to transit.
  - Provision of bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting residential areas with neighborhood commercial centers, recreational facilities, schools, and other public areas.
  - Contributions for off-site mitigation for transit use

- Provision of charging stations for electric vehicles within large employment-generating and retail developments.
- Policy 10.6.2c Budget for purchase of clean fuel vehicles, including electrical and hybrid vehicles where appropriate, and if feasible, purchasing natural gas vehicles as diesel powered vehicles are replaced.
- Policy 10.6.2d Support and facilitate employer-based trip reduction programs by recognizing such programs in environmental mitigation measures for traffic and air quality impacts where their ongoing implementation can be ensured, and their effectiveness can be monitored.
- Policy 10.6.2e As part of the development review process for non-residential development, require the incorporation of best available technologies to mitigate air quality impacts.
- Policy 10.6.2f Provide physical separations between (1) proposed new industries having the potential for emitting toxic air contaminants and (2) existing and proposed sensitive receptors (e.g., residential areas, schools, and hospitals).
- Policy 10.6.2g Require new wood-burning stoves and fireplaces to comply with EPA and BAAQMD approved standards.

### Policy Consistency Analysis

The project is required by law to comply with all federal, State, and BAAQMD regulations pertaining to emissions of air pollutants during construction and occupation of the project. Mitigation measures in the following section address compliance with these laws. The project would be consistent with air quality policies related to residential development in the City of Antioch's General Plan. Specifically, the project would implement dust abatement practices during construction (Policy 10.6.2a); incorporate bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting to the hotel and villas within the site (Policy 10.6.2b); and require new wood-burning stoves and fireplaces that comply with EPA and BAAQMD standards (Policy 10.6.2g).

## 4.3.2 IMPACTS AND MITIGATION MEASURES

### Significance Criteria

CEQA Guidelines prepared by BAAQMD are used to establish the significance criteria to judge the impacts caused by the project. The following are the significance criteria that are used to judge project impacts. The project would have significant impacts if it would:

- a. Conflict with or obstruct implementation of the applicable air quality plan;
- b. Result in a cumulatively considerable net increase of any criteria pollutant or a precursor to that pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors); this is

judged by comparing direct and indirect project emissions to BAAQMD significance thresholds of 80 pounds per day for ROG, NO<sub>x</sub>, or PM<sub>10</sub>;

- c. A substantial contribution to an existing or project violation of an ambient air quality standard would result if the project would cause an exceedance of the California Ambient Air Quality Standard for carbon monoxide of 9.0 parts per million (ppm) over an 8-hour averaging period;
- d. Expose sensitive receptors or the general public to substantial pollutant concentrations; this is evaluated by assessing the health risk in terms of cancer risk or hazards posed by the placement of new sources of air pollutant emissions near existing sensitive receptors or placement of new sensitive receptors near existing sources; or
- e. Create or expose a substantial number of people to objectionable odors

### Less Than Significant Impacts

#### **Air Quality Standards and/or Projected Air Quality Violations**

CO emissions from traffic generated by the project would be the greatest pollutant concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of CO. Measured CO levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. Highest measured 8-hour CO levels over the last three years are 1.9 ppm in Pittsburg, Calif.

The contribution of project-generated traffic to these levels was predicted following the screening guidance recommended by the BAAQMD. A review of intersection traffic volumes and level of service was conducted to identify intersections with the potential for highest CO levels that would be affected by the project. Two intersections, Lone Tree Way and Hillcrest Avenue, and Lone Tree Way and James Donlon Boulevard were considered the worst intersections (in terms of elevated CO levels from traffic) that may be affected by project-generated traffic. Future CO levels were predicted near these intersections for existing conditions and future conditions with the project in place using traffic projections provided by W-Trans. Emission factors used were calculated using the EMFAC2007 model, developed by the California Air Resources Board, with default assumptions for Contra Costa County during the winter, assuming a temperature of 40 degrees Fahrenheit. A slow speed of 5 miles per hour was used which results in higher emission rates. The screening analysis included the number of through lanes in the intersection configuration with a receptor located at the edge of the roadway. Screening calculations are provided in **Appendix C**. Refined modeling using wider roadways that account for turn lanes would result in lower concentrations due to an increase in mixing zone width. Results are reported as follows:

Table 4.3-5 Predicted Roadside 8-Hour Carbon Monoxide Concentrations

Description	Existing (2008)	Future with Project (2015)
Intersection 20: Lone Tree Way and Hillcrest Avenue	3.5 ppm	2.8 ppm
Intersection 10: Lone Tree Way and James Donlon Boulevard	4.7 ppm	3.7 ppm
<i>BAAQDM Thresholds</i>	<i>9.0 ppm (CAAQS)</i>	

Source: Illingworth & Rodkin, Inc.

The highest 8-hour concentration with the project in place (in 2015) is predicted to be 3.7 ppm over an 8-hour averaging period. This concentration would occur along Lone Tree Way and Hillcrest Avenue. Lower concentrations would occur at other intersections affected by project traffic. This represents the roadside concentration with future PM peak hour conditions, as reported by W-Trans. The results of this screening analysis indicate that project levels would be below the California Ambient Air Quality Standard (used to judge the significance of the impact) of 9.0 ppm; therefore, the impact is considered less than significant. Had levels been above the ambient air quality standards, a more refined analysis would have been conducted using the CALINE4 dispersion model and actual lane-receiver geometry.

### Objectionable Odors

During construction, the various diesel powered vehicles and equipment in use on site would create localized odors. These odors would be temporary and not likely noticeable for extended periods of time much beyond the project's site boundaries. The potential for diesel odor impacts is therefore less than significant. The proposed uses that would be constructed are not expected to produce any offensive odors that would result in frequent odor complaints; therefore this also would be a less than significant impact.

### Implementation of Applicable Air Quality Plan

#### *Clean Air Plan Consistency with Population and Vehicle Miles Traveled Projections*

A key element in air quality planning is to make reasonably accurate projections of future human activities related to air pollutant emissions. When the Bay Area 2005 Ozone Strategy was developed, it utilized the most recent projections developed by the Association of Bay Area Governments (ABAG). The projections for the City of Antioch were based on the assumptions in the General Plan EIR.

Because the potential future build-out of the Roddy Ranch Focus Area would be less than that assumed in the General Plan (per Measure K), the resulting growth would be considered consistent with projections used to develop the most recent Clean Air Plan. That is, development of Roddy Ranch Focus Area would not interfere with population and vehicle miles traveled projections used to develop the latest regional clean air planning projections. This would be a less than significant impact.

### *Consistency with Transportation Control Measures*

The Bay Area 2005 Ozone Strategy includes 20 transportation control measures, seven of which require participation at the local level. The General Plan includes policies that effectively implement five of the seven required transportation control measures (TCM 1 Support voluntary employer-based trip reduction program, TCM 9 Improve bicycle access and facilities, TCM 12 Arterial Management Measures, TCM 17 Conduct Demonstration Projects, and TCM 19 Improve pedestrian access and facilities). The City's Engineering Department and/or the City's Traffic Calming Committee, comprised of members from the City Council and Planning Commission, review the TCMs and develop strategies for compliance. Future development within Roddy Ranch will be required to comply with all adopted City programs designed to ensure compliance with the 2005 Ozone Strategy. Therefore, this would be a less than significant impact. Mitigation Measure 4.3-1 also includes measures that would implement Clean Air Plan TCMs.

### Significant Impacts

**Impact 4.3-1: The project could result in a cumulatively considerable net increase of any criteria pollutant for which the region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)**

The Bay Area is considered a non-attainment area for ground-level ozone (O<sub>3</sub>) under both the federal Clean Air Act and the California Clean Air Act. The area is also considered in non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM<sub>10</sub>), and particulate matter with a diameter of less than 2.5 micrometers (PM<sub>2.5</sub>) under the California Clean Air Act, but not under the Federal Clean Air Act. The area has attained both State and federal ambient air quality standards for CO. As part of an effort to attain and maintain ambient air quality standards for ozone and PM<sub>10</sub>, BAAQMD has established thresholds of significance for air pollutants. These thresholds are for ozone precursor pollutants (reactive organic gases [ROG] and nitrogen oxides [NOx]) and PM<sub>10</sub>. The Bay Area has attained CO standards.

The project would add new development and traffic trips to the region, which would lead to increased emissions of air pollutants. Emissions of air pollutants associated with the project were predicted using the URBEMIS2007 model (Version 9.2.4), distributed by the Rimpco Associates ([www.urbemis.com](http://www.urbemis.com)) and recommended for use by BAAQMD. This model predicts daily emissions associated with land use developments. The model combines predicted daily traffic activity, associated with the different land use types, with emission factors from the State's mobile emission factor model (i.e., EMFAC2007). W-Trans provided trip generation rates in the traffic report for the project.

The Roddy Ranch Project proposes to construct 574 single-family residences, 100 multi-family townhomes/villas, and a 250-room hotel. Default model inputs for the San Francisco Bay Area Air Basin were used in the modeling along with the project land uses and trip generation rates. Mitigation measures in URBEMIS2007 were used to account

for project features, such as sidewalks and bicycle lanes. Reductions for mixed uses and transit service were not included.

The model also predicts area source emissions associated with the proposed projects, which are minor compared to emissions associated with traffic. Residential projects are a source of ROG emissions, as residences typically contain consumer products, solvents and paints that emit this air pollutant. These emissions are predicted by URBEMIS2007 based on a state default value.

The ROG emissions from mobile sources include different automobile operating modes such as running emissions, evaporation from running and resting, and diurnal emissions that occur mostly from changes in temperature and pressure that cause fuel vapor to be emitted to the atmosphere. These emissions also include increased emission rates (due to incomplete combustion) that occur when a cold car is started. NO<sub>x</sub> emissions are comprised of running exhaust and a slight increase in rates during the initial engine running periods.

PM<sub>10</sub> emissions are comprised of running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles. Since much of the project traffic fleet is made up of light-duty gasoline-powered vehicles, a majority of the PM<sub>10</sub> emissions is from entrainment of roadway dust from vehicle travel.

URBEMIS2007 Model output files are included in **Appendix C**. Daily emissions predicted with full build-out of the project are reported in **Table 4.3-6** and compared against BAAQMD thresholds. As shown in **Table 4.3-6**, the combination of new travel and new consumer product use by residences associated with the project would result in emissions of ROG and PM<sub>10</sub> that exceed BAAQMD significance thresholds.

Table 4.3-6 Daily Project Emissions for implementation of the Roddy Ranch Project in Pounds Per Day

Scenario	Modeled Daily Emissions in Pounds Per Day (lbs/day)			
	Reactive Organic Gases (ROG)	Nitrogen Oxides (NOx)	Respirable Particulates (PM <sub>10</sub> )	Fine Particulates (PM <sub>2.5</sub> )
Roddy Ranch Proposed Project Area Sources	50	9	0	0
Roddy Ranch Proposed Project Operational Sources	45	49	119	23
<b>Roddy Ranch Proposed Project Total Sources</b>	<b>95</b>	<b>58</b>	<b>119</b>	<b>23</b>
<i>BAAQMD Significance Thresholds</i>	<i>80</i>	<i>80</i>	<i>80</i>	<i>--</i>

**Mitigation Measure 4.3-1:** The applicant shall incorporate the following measures, which would reduce traffic trips and direct project air pollutant emissions.

1. The project shall install appropriate bicycle amenities including bike lane connections throughout the project site. Offsite bicycle lane improvements also shall be included for roadways modified by the project that would serve the project site;
2. Provide pedestrian signage; include convenient pedestrian crossings at strategic areas that would enhance pedestrian use;
3. Consult with the City of Antioch and Tri-Delta Transit to identify any transit amenities that should be included for possible future transit service at the project site;
4. Review landscape plans along public or common areas and future non-residential uses to ensure that new trees are provided that would shade buildings and walkways and reduce cooling loads on buildings in summer;
5. Require that new buildings constructed as part of the project exceed State building code energy efficiency standards by at least 15% over 2005 requirements;
6. Install only *EnergyStar* or better rated space heating and cooling equipment, and appliances. This would include high efficiency air conditioning (heating and cooling) systems and water heaters.
7. Install only low-emittance coated windows;
8. Include outdoor electrical outlets to encourage use of electric-powered landscape equipment;
9. Install plumbing to accommodate solar water heating systems;

10. Install low-flow water fixtures for all toilets, shower heads, and faucets;  
and
11. Installed landscaping shall be drought tolerant and include efficient irrigation systems with automatic timers.

**Significance After Mitigation:** Significant and unavoidable

Although the mitigation measures listed are expected to further reduce emissions from project build-out, emissions of ROG, which are mostly produced by consumer products, and PM<sub>10</sub> would continue to be above the significance thresholds.

**Impact 4.3-2: Sensitive receptors could be exposed to substantial pollutant concentrations during project construction**

*Construction Dust*

Dust would be generated during grading and construction activities and most of the dust would result during grading activities. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed, amount of activity, soil conditions and meteorological conditions. Typical winds during late spring through summer are from the west. Existing land uses near the site are vacant. Although existing sensitive receptors currently do not reside near the site, future residences constructed as part of the project may be exposed to construction emissions. In addition, construction dust emissions can contribute to regional PM<sub>10</sub> emissions.

Although grading and construction activities would be temporary, they would have the potential to cause both nuisance and health air quality impacts. PM<sub>10</sub> is the pollutant of greatest concern associated with dust. If uncontrolled, PM<sub>10</sub> levels downwind of actively disturbed areas could possibly exceed State standards.

*Construction Equipment Exhaust*

The CARB and BAAQMD recommend that diesel exhaust emissions be reduced. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known Toxic Air Contaminant. BAAQMD has not developed any procedures or guidelines for identifying these impacts from temporary construction activities where emissions are transient. They are typically evaluated for stationary sources (e.g., large compression ignition engines such as generators) in health risk assessments over the course of lifetime exposures (i.e., 24 hours per day over 70 years). These construction activities would not be near sensitive receptors and are expected to occur during a relatively short time.

**Mitigation Measure 4.3-2a:** The applicant shall implement the following measures recommended by BAAQMD to reduce the air quality impacts of particulate matter (PM<sub>2.5</sub>) associated with grading and new construction.

1. Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to residences should be kept damp at all times.
2. Cover all hauling trucks or maintain at least 2 feet of freeboard.

3. Pave, apply water at least twice daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas.
4. Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas and sweep streets daily (with water sweepers) if visible soil material is deposited onto the adjacent roads.
5. Hydro seed or apply (non-toxic) soil stabilizers to inactive construction areas (i.e., previously-graded areas that are inactive for 10 days or more).
6. Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles.
7. Limit traffic speeds on any unpaved roads to 15 m.p.h.
8. Replant vegetation in disturbed areas as quickly as possible.
9. Suspend construction activities that cause visible dust plumes to extend beyond the construction site.

**Mitigation Measure 4.3-2b:** The applicant shall implement the following measures recommended by BAAQMD to control diesel exhaust emissions associated with grading and new construction.

1. Diesel equipment standing idle for more than five minutes shall be turned off; this includes trucks waiting to deliver or receive soil, aggregate, or other bulk materials; rotating drum concrete trucks can keep their engines running continuously as long as they are on site.
2. Properly tune and maintain equipment for low emissions.
3. Avoid staging equipment within 200 feet of residences.

**Significance After Mitigation:** Less than significant

### Cumulative Impacts

Cumulative impacts are addressed in **Chapter 6.0, CEQA Required Conclusions**, of this EIR.

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