

## 9.0 AIR QUALITY

This chapter includes a discussion of existing air quality conditions, a summary of applicable regulations, and an analysis of potential short-term and long-term air quality impacts of the proposed project. The method of analysis for short-term construction, long-term regional (operational), local mobile-source, odor, and toxic air emissions is consistent with the recommendations of the Placer County Air Pollution Control District (PCAPCD).

### 9.1 ENVIRONMENTAL SETTING

The project area is located in the central portion of Placer County, California, which is within the Mountain Counties Air Basin (MCAB). The MCAB also comprises all of Amador, Calaveras, Mariposa, Nevada, Plumas, Sierra, and Tuolumne Counties and the majority of El Dorado County. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the ability of the atmosphere to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the project area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

#### 9.1.1 TOPOGRAPHY, CLIMATE, AND METEOROLOGY

Elevations within the MCAB vary from less than 1,000 feet above sea level in the west to more than approximately 6,000 feet above sea level in the east. The general climate in the MCAB varies considerably with elevation and proximity to the Sierra Nevada crest. The terrain features of the MCAB make it possible for various climates to exist in relatively close proximity. The pattern of mountains and hills causes a wide variation in rainfall, temperature, and localized winds throughout the MCAB.

The local topographical and meteorological conditions in the MCAB largely determine the effect of air pollutant emissions in the basin. Regional airflows are affected by the mountains and hills, which direct surface airflows, cause shallow vertical mixing, and hinder dispersion, thereby creating areas of high pollutant concentrations. Inversion layers, where warm air overlies cooler air, frequently occur and trap pollutants close to the ground. In the winter, these conditions can lead to carbon monoxide (CO) “hot spots” along heavily traveled roads and at busy intersections. During the summer, with its longer daylight hours, stagnant air, and high temperatures, plentiful sunshine provides the energy needed to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO<sub>x</sub>), which in turn result in ozone formation.

Local meteorology of the project area is represented by measurements recorded at the Auburn station. Relative humidity is generally in the moderate to low range. Precipitation is moderate to occasionally heavy in the winter; the normal annual precipitation, which occurs primarily from November through March, is approximately 35 inches. January temperatures range from a normal minimum of 36 degrees Fahrenheit (°F) to a normal maximum of 54°F. July temperatures range from a normal minimum of 62°F to a normal maximum of 93°F (NOAA 1992). The predominant wind direction and speed is from the south-southwest at less than 9 mph, although winds can reach high speeds during storms (ARB 1994).

#### 9.1.2 EXISTING AIR QUALITY—CRITERIA AIR POLLUTANTS

Concentrations of criteria air pollutants are used as indicators of ambient air quality conditions. Source types, health effects, and future trends for each criteria air pollutant are briefly described below, along with the most current attainment area designations and monitoring data for the project area.

## **OZONE**

Ozone is the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO<sub>x</sub> in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO<sub>x</sub> are a group of gaseous compounds of nitrogen and oxygen that result from high-temperature combustion processes, such as those occurring in automobiles and power plants, and from natural sources, such as lightning, biological and abiological processes in soil, and stratospheric intrusion. While natural background emissions of NO<sub>x</sub> compounds are known to exist, research has shown the levels to be many times lower than those found around metropolitan and industrialized areas.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 1991).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 part per million (ppm) for 1–2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing the amount of air breathed in and out, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to such adverse health effects as throat dryness, chest tightness, headache, and nausea. Evidence also exists that ozone exposure can interfere with or inhibit the immune system's ability to defend against infection of the respiratory system (Godish 1991).

Emissions of ozone precursors ROG and NO<sub>x</sub> in the MCAB have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels (ARB 2005a).

## **CARBON MONOXIDE**

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the CO emitted nationwide comes from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, industrial sources, and natural sources, such as wildfires (EPA 2006).

Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2006a). The highest concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO tends to cause problems in localized areas.

## **NITROGEN DIOXIDE**

Nitrogen dioxide (NO<sub>2</sub>) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO<sub>2</sub> are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts

through oxidation in the atmosphere to form NO<sub>2</sub> (EPA 2006a). The combined emissions of NO and NO<sub>2</sub> are referred to as NO<sub>x</sub> and reported as equivalent NO<sub>2</sub>. Because NO<sub>2</sub> is formed and depleted by reactions associated with photochemical smog (ozone), the NO<sub>2</sub> concentration in a particular geographical area may not be representative of the local NO<sub>x</sub> emission sources.

Inhalation is the most common route of exposure to NO<sub>2</sub>. Because NO<sub>2</sub> has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms during or shortly after exposure, including coughing, difficulty with breathing, vomiting, headache, and eye irritation. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO<sub>2</sub> intoxication after acute exposure has occasionally been linked to prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung functions.

## **SULFUR DIOXIDE**

Sulfur dioxide (SO<sub>2</sub>) is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills and naturally by sea spray and volcanoes. The major adverse health effects associated with SO<sub>2</sub> exposure pertain to the upper respiratory tract. SO<sub>2</sub> is a respiratory irritant; the bronchioles constrict when 5 ppm or more of SO<sub>2</sub> is inhaled. On contact with the moist mucous membranes, SO<sub>2</sub> produces sulfurous acid, which is a direct irritant. The concentration of SO<sub>2</sub> to which a person is exposed is a more important determinant of respiratory effects than duration of exposure. Exposure to high SO<sub>2</sub> concentrations may result in edema of the lungs or glottis and respiratory paralysis.

## **PARTICULATE MATTER**

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM<sub>10</sub>. PM<sub>10</sub> consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO<sub>2</sub> and ROG (EPA 2006a). Fine particulate matter (PM<sub>2.5</sub>) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (ARB 2006).

The adverse health effects associated with PM<sub>10</sub> depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAHs), and other toxic substances adsorbed onto fine particulate matter (the piggybacking effect), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM<sub>10</sub> may result from both short-term and long-term exposure to elevated concentrations. These health effects may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (EPA 2006a). PM<sub>2.5</sub> poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of both PM<sub>10</sub> and PM<sub>2.5</sub> have increased in the MCAB between 1975 and 2000 and are projected to increase through 2020 (ARB 2005a).

## **LEAD**

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline (discussed in detail below), metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. Environmental Protection Agency (EPA) set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995 (EPA 2006a).

All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate areas for the national lead standard). (Air quality attainment status designations are described below.) Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose “hot spot” problems in some areas.

## MONITORING STATION DATA AND ATTAINMENT AREA DESIGNATIONS

Criteria air pollutant concentrations are measured at several monitoring stations in the MCAB. The Auburn and Roseville stations are the closest in proximity to the project area with recent data for ozone, NO<sub>2</sub>, CO, PM<sub>10</sub>, and PM<sub>2.5</sub>. In general, the ambient air quality measurements from these stations are representative of the air quality in the vicinity of the project area. Table 9-1 summarizes the air quality data from the most recent 3 years.

Both the California Air Resources Board (ARB) and EPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are “nonattainment,” “attainment,” and “unclassified.” The “unclassified” designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called “nonattainment-transitional.” The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. Attainment designations for the year 2005 with respect to the Placer County portion of the MCAB are shown in Table 9-2 for each criteria air pollutant.

<b>Table 9-1 Summary of Annual Ambient Air Quality Data (2004–2006)</b>			
	2004	2005	2006
<b>OZONE</b>			
<b>Auburn—108 C Avenue Monitoring Station</b>			
Maximum concentration (1-hour/8-hour average, ppm)	0.118/0.101	0.120/0.107	0.129/ 0.114
Number of days state standard exceeded (1-hour)	14	11	25
Number of days national 1-hour/8-hour standard exceeded	0/12	0/10	1/29
<b>CARBON MONOXIDE (CO)</b>			
<b>Roseville—North Sunrise Avenue Monitoring Station</b>			
Maximum concentration (1-hour/8-hour average, ppm)	2.6/1.93	2.0/1.27	-
Number of days state standard exceeded (8-hour)	0	0	-
Number of days national standard exceeded (1-hour/8-hour)	0/0	0/0	-
<b>NITROGEN DIOXIDE (NO<sub>2</sub>)</b>			
<b>Roseville—North Sunrise Avenue Monitoring Station</b>			
Maximum concentration (1-hour average, ppm)	0.067	0.079	0.063
Number of days state standard exceeded	0	0	0
Annual average (ppm)	0.013	0.013	0.013

**Table 9-1  
Summary of Annual Ambient Air Quality Data (2004–2006)**

	2004	2005	2006
<b>FINE PARTICULATE MATTER (PM<sub>2.5</sub>)</b>			
<b>Roseville—North Sunrise Avenue Monitoring Station</b>			
Maximum concentration (µg/m <sup>3</sup> )	47.8	59.2	45.0
Number of days national standard exceeded (measured <sup>1</sup> )	0	0	0
<b>RESPIRABLE PARTICULATE MATTER (PM<sub>10</sub>)</b>			
<b>Roseville—North Sunrise Avenue Monitoring Station</b>			
Maximum concentration (µg/m <sup>3</sup> )	43.0	40.0	55.0
Number of days state standard exceeded (measured/calculated <sup>a</sup> )	0/0	0/0	1
Number of days national standard exceeded (measured/calculated <sup>a</sup> )	0/0	0/0	0
Notes: µg/m <sup>3</sup> = micrograms per cubic meter; ppm = parts per million			
<sup>a</sup> Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.			
Source: ARB 2007, EPA 2007a			

### 9.1.3 EXISTING AIR QUALITY—TOXIC AIR CONTAMINANTS

Concentrations of toxic air contaminants (TACs) (in federal parlance, “hazardous air pollutants” [HAPs]) are also used as indicators of ambient air quality conditions. TACs are defined as air pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 9-2).

According to the *California Almanac of Emissions and Air Quality* (ARB 2005a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, and lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory’s PM<sub>10</sub> database, ambient PM<sub>10</sub> monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene are the TACs for which data are available that pose the greatest existing ambient risk in California.

According to ARB, there are no facilities in the vicinity of the project that emit TACs (ARB 2005b).

Table 9-2 Ambient Air Quality Standards and Designations							
Pollutant	Averaging Time	California			National Standards <sup>a</sup>		
		Standards <sup>b,c</sup>	Attainment Status (Placer County portion of MCAB) <sup>f</sup>	Primary <sup>c,e</sup>	Secondary <sup>c,f</sup>	Attainment Status (Placer County portion of MCAB) <sup>g</sup>	
Ozone	1-hour	0.09 ppm (180 µg/m <sup>3</sup> )	N	- <sup>i</sup>	Same as primary standard	N <sup>i</sup>	
	8-hour	0.070 ppm <sup>h</sup> (137 µg/m <sup>3</sup> )	-	0.08 ppm (157 µg/m <sup>3</sup> )		N (Serious)	
Carbon monoxide (CO)	1-hour	20 ppm (23 mg/m <sup>3</sup> )	U	35 ppm (40 mg/m <sup>3</sup> )	-	U/A	
	8-hour	9 ppm (10 mg/m <sup>3</sup> )		9 ppm (10 mg/m <sup>3</sup> )			
Nitrogen dioxide (NO <sub>2</sub> )	Annual arithmetic mean	0.030 ppm (56 µg/m <sup>3</sup> )	-	0.053 ppm (100 µg/m <sup>3</sup> )	Same as primary standard	U/A	
	1-hour	0.18 ppm (338 µg/m <sup>3</sup> )	A	-			
Sulfur dioxide (SO <sub>2</sub> )	Annual arithmetic mean	-	-	0.030 ppm (80 µg/m <sup>3</sup> )	-	U	
	24-hour	0.04 ppm (105 µg/m <sup>3</sup> )	A	0.14 ppm (365 µg/m <sup>3</sup> )			
	3-hour	-	-	-			0.5 ppm (1300 µg/m <sup>3</sup> )
	1-hour	0.25 ppm (655 µg/m <sup>3</sup> )	A	-			
Respirable particulate matter (PM <sub>10</sub> )	Annual arithmetic mean	20 µg/m <sup>3</sup>	N	- <sup>f</sup>	Same as primary standard	U/A	
	24-hour	50 µg/m <sup>3</sup>		150 µg/m <sup>3 f</sup>			
Fine particulate matter (PM <sub>2.5</sub> )	Annual arithmetic mean	12 µg/m <sup>3</sup>	U	15 µg/m <sup>3</sup>	Same as primary standard	U/A	
	24-hour	-	-	35 µg/m <sup>3</sup>			
Lead <sup>j</sup>	30-day average	1.5 µg/m <sup>3</sup>	A	-	-	-	
	Calendar quarter	-	-	1.5 µg/m <sup>3</sup>			Same as primary standard
Sulfates	24-hour	25 µg/m <sup>3</sup>	A		<b>No national standards</b>		
Hydrogen sulfide	1-hour	0.03 ppm (42 µg/m <sup>3</sup> )	U				
Vinyl chloride <sup>j</sup>	24-hour	0.01 ppm (26 µg/m <sup>3</sup> )	U/A				

**Table 9-2  
Ambient Air Quality Standards and Designations**

Pollutant	Averaging Time	California		National Standards <sup>a</sup>		
		Standards <sup>b,c</sup>	Attainment Status (Placer County portion of MCAB) <sup>f</sup>	Primary <sup>c,e</sup>	Secondary <sup>c,f</sup>	Attainment Status (Placer County portion of MCAB) <sup>g</sup>
Visibility-reducing particulate matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

Notes: MCAB = Mountain Counties Air Basin;  $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter; ppm = parts per million

<sup>a</sup> National standards (other than ozone, particulate matter (PM), and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM<sub>10</sub> 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The PM<sub>2.5</sub> 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency (EPA) for further clarification and current federal policies.

<sup>b</sup> California standards for ozone, CO (except Lake Tahoe), SO<sub>2</sub> (1- and 24-hour), NO<sub>2</sub>, PM, and visibility-reducing particulate matter are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

<sup>c</sup> Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )]. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

<sup>d</sup> Unclassified (U): A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.  
 Attainment (A): A pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.  
 Nonattainment (N): A pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.  
 Nonattainment/Transitional (NT): A subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

<sup>e</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

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

<sup>g</sup> Nonattainment (N): Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.  
 Attainment (A): Any area that meets the national primary or secondary ambient air quality standard for the pollutant.  
 Unclassifiable (U): Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

<sup>h</sup> This concentration was approved by the California Air Resources Board (ARB) on April 28, 2005, and is expected to become effective in early 2006.

<sup>i</sup> The 1-hour ozone national ambient air quality standard was revoked on June 15, 2005. The annual PM10 NAAQS was revoked in 2006.

<sup>j</sup> ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold 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.

Sources: ARB 2007, EPA 2007a

## EXISTING AIR QUALITY – GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE

Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. The earth emits this radiation, which was initially absorbed, back to space, but the properties of the radiation have changed from high-frequency solar radiation to lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. Without the Greenhouse Effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the Greenhouse Effect are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), ozone, nitrous oxide, water vapor, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs (with the exception of water vapor) in excess of natural ambient concentrations are responsible for intensifying the Greenhouse Effect and have led to a trend of warming of the earth's climate, known as global climate change or global warming (Ahrens 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission [CEC] 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006a). Emissions of CO<sub>2</sub> are byproducts of fossil fuel combustion and are the largest portion of human-caused GHG emissions by mass. Methane, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) associated with agricultural practices and landfills. CO<sub>2</sub> sinks, or reservoirs, include sequestration by vegetation or dissolution into the ocean, among other processes.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO<sub>2</sub> in the world (CEC 2006a). California produced 492 million gross metric tons of carbon dioxide equivalent in 2004 (CEC 2006a). Carbon dioxide equivalent is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the Greenhouse Effect. This potential, known as the global warming potential of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation References," of the General Reporting Protocol of the California Climate Action Registry (2006), 1 ton of CH<sub>4</sub> has the same contribution to the Greenhouse Effect as approximately 21 tons of CO<sub>2</sub>. Therefore, CH<sub>4</sub> is a much more potent GHG than CO<sub>2</sub>. Expressing emissions in carbon dioxide equivalent takes the contributions of all GHG emissions to the Greenhouse Effect and converts them to a single unit equivalent to the effect that would occur if only CO<sub>2</sub> were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state (CEC 2006a). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (22.2%) and the industrial sector (20.5%)(CEC 2006a).

According to the Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3–7°F by the end of the century, depending on future GHG emission scenarios (IPCC 2007). Resource areas other than air quality and atmospheric temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada, which is a major source of supply for the state. According to the CEC (2006b), the snowpack

portion of the water supply could potentially decline by 30–90% by the end of the 21st century. A study cited in a report by the California Department of Water Resources (DWR) projects that approximately 50% of the statewide snowpack will be lost by the end of the century (Knowles and Cayan 2002). Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. An increase in precipitation falling as rain rather than snow could also lead to increased potential for floods because water that would normally be held in the Sierra Nevada snowpack until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system (DWR 2006).

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century (CEC 2006b), and it is predicted to rise an additional 7–22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2007). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion (especially a concern in the low-lying Sacramento–San Joaquin River Delta, where pumps delivering potable water could be threatened), and disruption of wetlands (CEC 2006b). As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available.

## **ASBESTOS**

Naturally occurring asbestos may be found in at least 44 of California's 58 counties. Asbestos is the name for a group of naturally occurring silicate minerals. Exposure to asbestos may result in inhalation or ingestion of asbestos fibers, which over time and may result in damage to the lungs or membranes that cover the lungs, leading to illness or even death.

Naturally occurring asbestos, often found in serpentine rock formations, is present in several foothill areas of Placer County. When material that contains naturally occurring asbestos is disturbed, asbestos fibers may be released and become airborne, thereby creating a potential health hazard.

The California Geological Survey (formerly the California Division of Mines and Geology) has recently developed an enhanced 1:1,000,000 scale map that has improved the overall identification of locations in Placer County. The map denotes areas of Placer County that are more or less likely to contain naturally occurring asbestos, based on available soil and geologic studies and some field verification. Where an area is characterized as having a lower overall probability of presence of naturally occurring asbestos, the likelihood of presence is slight, but in some instances naturally occurring asbestos might be found within such an area. Similarly, a location in the area identified as being most likely to have naturally occurring asbestos may not contain it.

The California Geological Survey's map shows areas of higher probability for asbestos-containing rock within the broad zone of faults that follow the low foothills and lie in a southeast-to-northwest band. The Placer County communities of Auburn, Colfax, Meadow Vista, and Foresthill are among those that are within this fault band. Generally, there are no areas of high probability of occurrence of naturally occurring asbestos in areas of Placer County west of Folsom Lake or south of Wise Road. That is, Roseville (and Granite Bay), Rocklin, Lincoln, Loomis, Penryn, and Newcastle lie within geologic areas that have a lower probability for the presence of naturally occurring asbestos. There are some isolated areas of higher probability of presence of naturally occurring asbestos within the Tahoe National Forest.

Deposits of naturally occurring asbestos have been found in rock other than ultramafic and serpentine rock; for example, deposits have been found in metavolcanic rocks such as the Copper Hill Volcanics in the Folsom vicinity. Metavolcanic rock formations are prevalent to the northeast, north, and west of Auburn. Finally, in areas of sedimentary or alluvial rock deposits like those in western Placer County, it is possible that analytically detectable naturally occurring asbestos may be found.

According to *Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California* (Higgins and Clinkenbeard 2006) and *A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill and Hill 2000), the project area is not located in an area that is likely to contain naturally occurring asbestos.

## **9.2 REGULATORY SETTING**

Air quality in Placer County is regulated by EPA, ARB, and PCAPCD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

### **9.2.1 CRITERIA AIR POLLUTANTS**

Air quality regulations focus on the following air pollutants: ozone, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, and lead. Because these are the most prevalent air pollutants known to be deleterious to human health, and because extensive health-effects criteria documents are available, these pollutants are commonly referred to as “criteria air pollutants.”

#### **FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS**

At the federal level, EPA has been charged with implementing national air quality programs. EPA’s air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 9-2, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all state SIPs to determine whether they conform to the mandates of the CAA and its amendments, and for determining whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. If the state fails to submit an approvable SIP or to implement the plan within the mandated time frame, EPA may apply sanctions to transportation funding and stationary air pollution sources in the air basin.

#### **STATE PLANS, POLICIES, REGULATIONS, AND LAWS**

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS) (Table 9-2). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the

emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Other ARB responsibilities include overseeing local air districts' compliance with California and federal laws; approving local air quality plans; submitting SIPs to EPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

## **LOCAL PLANS, POLICIES, REGULATIONS, AND LAWS**

### **Placer County Air Pollution Control District Rules and Regulations**

PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of PCAPCD includes the preparation of plans for the attainment of ambient air-quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. PCAPCD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and the CCAA. Air quality plans applicable to the proposed project are discussed below.

All projects are subject to PCAPCD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include the following:

- ▶ **Rule 202—Visible Emissions.** A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any one hour which is as dark or darker in shade as that designated as number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.
- ▶ **Rule 217—Cutback and Emulsified Asphalt Paving Materials.** A person shall not manufacture for sale nor use for paving, road construction, or road maintenance any: rapid cure cutback asphalt; slow cure cutback asphalt containing organic compounds which evaporate at 500°F or lower as determined by current American Society for Testing and Materials (ASTM) Method D402; medium cure cutback asphalt except as provided in Section 1.2.; or emulsified asphalt containing organic compounds which evaporate at 500°F or lower as determined by current ASTM Method D244, in excess of 3% by volume.
- ▶ **Rule 218—Application of Architectural Coatings.** No person shall: (i) manufacture, blend, or repackage for sale within PCAPCD; (ii) supply, sell, or offer for sale within PCAPCD; or (iii) solicit for application or apply within PCAPCD, any architectural coating with a volatile organic carbon (VOC) content in excess of the corresponding specified manufacturer's maximum recommendation. "Manufacturer's maximum recommendation" means the maximum recommendation for thinning that is indicated on the label or lid of the coating container.
- ▶ **Rule 228—Fugitive Dust.**
  - *Visible Emissions Not Allowed Beyond the Boundary Line:* A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area (including disturbance as a result of the raising and/or keeping of animals or by vehicle use), such that the presence of such dust remains visible in the atmosphere beyond the boundary line of the emission source.
  - *Visible Emissions from Active Operations:* In addition to the requirements of Rule 202, Visible Emissions, a person shall not cause or allow fugitive dust generated by active operations, an open storage pile, or a disturbed surface area, such that the fugitive dust is of such opacity as to obscure an observer's

view to a degree equal to or greater than does smoke as dark or darker in shade as that designated as number 2 on the Ringelmann Chart, as published by the United States Bureau of Mines.

- *Concentration Limit:* A person shall not cause or allow PM<sub>10</sub> levels to exceed 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (24-hour average) when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA-approved equivalent method for PM<sub>10</sub> monitoring.
- *Track-Out onto Paved Public Roadways:* Visible roadway dust as a result of active operations, spillage from transport trucks, and the track-out of bulk material onto public paved roadways shall be minimized and removed.

The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventative measures, and removed within 1 hour from adjacent streets any time track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations.

All visible roadway dust tracked-out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a High Efficiency Particulate Air (HEPA) filter equipped vacuum device shall be used for roadway dust removal.

Any material tracked-out, or carried by erosion, and clean-up water, shall be prevented from entering waterways or storm water inlets as required to comply water quality control requirements.

- *Minimum Dust Control Requirements:* The following dust mitigation measures are to be initiated at the start and maintained throughout the duration of the construction or grading activity, including any construction or grading for road construction or maintenance.
  - Unpaved areas subject to vehicle traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered.
  - The speed of any vehicles and equipment traveling across unpaved areas must be no more than 15 miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust exceeding Ringelmann 2 or visible emissions from crossing the project boundary line.
  - Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile.
  - Prior to any ground disturbance, including grading, excavating, and land clearing, sufficient water must be applied to the area to be disturbed to prevent emitting dust exceeding Ringelmann 2 and to minimize visible emissions from crossing the boundary line.
  - Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt, from being released or tracked off-site.
  - When wind speeds are high enough to result in dust emissions crossing the boundary line, despite the application of dust mitigation measures, grading and earthmoving operations shall be suspended.

- No trucks are allowed to transport excavated material off-site unless the trucks are maintained such that no spillage can occur from holes or other openings in cargo compartments, and loads are either covered with tarps; or wetted and loaded such that the material does not touch the front, back, or sides of the cargo compartment at any point less than 6 inches from the top and that no point of the load extends above the top of the cargo compartment.
- *Wind-Driven Fugitive Dust Control:* A person shall take action(s), such as surface stabilization, establishment of a vegetative cover, or paving, to minimize wind-driven dust from inactive disturbed surface areas.
- ▶ **Rule 501—General Permit Requirements.** Any person operating an article, machine, equipment, or other contrivance, the use of which may cause, eliminate, reduce, or control the issuance of air contaminants, shall first obtain a written permit from the Air Pollution Control Officer (APCO). Stationary sources subject to the requirements of Rule 507, Federal Operating Permit Program, must also obtain a Title V permit pursuant to the requirements and procedures of that rule.

## Air Quality Plans

PCAPCD, in coordination with the air quality management districts and air pollution control districts of El Dorado, Sacramento, Solano, Sutter, and Yolo Counties, prepared and submitted the 1991 *Air Quality Attainment Plan* (AQAP) in compliance with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone and, to a lesser extent, CO and PM<sub>10</sub>. The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the AQAP must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The requirement of the CCAA for a first triennial progress report and revision of the 1991 AQAP was fulfilled with the preparation and adoption of the 1994 *Ozone Attainment Plan* (OAP). The OAP stresses attainment of ozone standards and focuses on strategies for reducing emissions of the ozone precursors ROG and NO<sub>x</sub>. It promotes active public involvement, enforcement of compliance with PCAPCD rules and regulations, public education in both the public and private sectors, development and promotion of transportation and land use programs designed to reduce vehicle miles traveled (VMT) within the region, and implementation of stationary- and mobile-source control measures. The OAP became part of the SIP in accordance with the requirements of the CAAA and amended the 1991 AQAP. However, at that time the region could not show that the national ozone (1-hour) standard would be met by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of “severe nonattainment” coupled with additional emission requirements on stationary sources. Additional triennial reports that acted as incremental updates were also prepared in 1997, 2000, and 2003 in compliance with the CCAA.

As a nonattainment area, the region is also required to submit rate-of-progress milestone evaluations in accordance with the CAAA. Milestone reports were prepared for 1996, 1999, and 2002, and one is being prepared for 2005. These milestone reports include demonstrations that the requirements for compliance have been met for the Sacramento nonattainment area. The air quality attainment plans and reports present comprehensive strategies to reduce ROG, NO<sub>x</sub>, and PM<sub>10</sub> emissions from stationary, area, mobile, and indirect sources. Such strategies include the adoption of rules and regulations; enhancement of California Environmental Quality Act (CEQA) participation; implementation of a new and modified indirect-source-review program; adoption of local air quality plans; and stationary-, mobile-, and indirect-source control measures.

In July 1997, EPA promulgated a new 8-hour ozone standard. This change lowered the standard for ambient ozone from 0.12 ppm averaged over 1 hour to 0.08 ppm averaged over 8 hours. In general, the 8-hour standard is more protective of public health and more stringent than the 1-hour standard. The promulgation of this standard prompted new designations and nonattainment classifications in June 2004, and resulted in the revocation of the 1-hour standard in June 2005. The region has been designated as a nonattainment (serious) area for the national (8-hour) ozone standard with an attainment deadline of June 2013.

Although the region has made significant progress in reducing ozone, a problem has arisen with regard to another issue. The region's transportation plan must conform and show that implementation will not harm the region's chances of attaining the ozone standard. The SIP is tied to a "motor vehicle emissions budget"; thus, transportation planners must ensure that emissions anticipated from plans and improvement programs remain within this budget. The region is not required to update the SIP before the ozone (8-hour) plans are due in 2006. However, since a conformity lapse began October 4, 2004, an expedited process to prepare a plan is under way (SMAQMD 2006).

## **9.2.2 TOXIC AIR CONTAMINANTS**

Air quality regulations also focus on TACs ("HAPs" in federal parlance). As mentioned in Section 9.1.3, "Existing Air Quality—Toxic Air Contaminants," above, a TAC is an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 9-2). Instead, EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by PCAPCD establish the regulatory framework for TACs.

### **FEDERAL HAZARDOUS AIR POLLUTANT PROGRAMS**

At the federal level, EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. (Major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources.) The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk-based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum, emissions of benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

### **STATE AND LOCAL TOXIC AIR CONTAMINANT PROGRAMS**

The State of California regulates TACs in California primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [1983]) and the Air Toxics Hot Spots Information and Assessment Act (AB 2588 [1987]). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB adopts an Airborne Toxics Control Measure (ACTM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure

must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for:

- ▶ more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines;
- ▶ zero-emission bus demonstration and purchase requirements applicable to transit agencies; and
- ▶ reporting requirements under which transit agencies must demonstrate compliance with the urban-transit bus-fleet rule.

Upcoming milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

In addition, ARB recently published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land use compatibility with TAC sources (ARB 2005). While not regulatory, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs (e.g., freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities) to help keep children and other sensitive populations out of harm's way.

At the local level, air pollution control or management districts may adopt and enforce ARB's control measures. Under PCAPCD Rule 501 ("General Permit Requirements"), Rule 502 ("New Source Review"), and Rule 507 ("Federal Operating Permit"), all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source review standards and air-toxics control measures. PCAPCD limits emissions and public exposure to TACs through a number of programs. PCAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by PCAPCD (e.g., health risk assessment) based on their potential to emit toxics. If it is determined that the project will emit toxics in excess of PCAPCD's threshold of significance for TACs (identified below), sources have to implement the BACT for TACs to reduce emissions. If a source cannot reduce the risk below the threshold of significance even after the BACT has been implemented, PCAPCD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs.

## **9.2.3 REGULATORY FRAMEWORK – GREENHOUSE GAS EMISSIONS**

### **ASSEMBLY BILL 32, THE CALIFORNIA CLIMATE SOLUTIONS ACT OF 2006**

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide greenhouse gas (GHG) emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will

be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

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

There are no federal or local laws, regulations, or policies pertaining to GHG emissions.

## **9.3 IMPACTS**

### **9.3.1 ANALYSIS METHODOLOGY**

Short-term construction-generated emissions of criteria air pollutants (e.g., PM<sub>10</sub>) and ozone precursors (ROG and NO<sub>x</sub>) were assessed in accordance with methodologies recommended by PCAPCD. Where quantification was required, emissions were modeled using air pollutant emission factors recommended by PCAPCD, ARB, and EPA. Modeling was based on project-specific data (e.g., estimated duration of construction, number and type of construction equipment) and default parameters. Modeled short-term construction-generated emissions were compared with applicable PCAPCD thresholds for determination of significance.

Long-term mobile-, stationary-, and area-source emissions were qualitatively assessed in accordance with methodologies recommended by PCAPCD. Predicted long-term operational emissions were compared with applicable PCAPCD thresholds for determination of significance.

All other air quality impacts (i.e., local mobile-source, odor, and TAC emissions) were assessed in accordance with methodologies recommended by ARB and PCAPCD and based on existing reference documentation.

### **9.3.2 THRESHOLDS OF SIGNIFICANCE**

Based on the Placer County CEQA Checklist and the State CEQA Guidelines, the proposed project would result in a potentially significant impact on air quality if it would:

- ▶ conflict with or obstruct implementation of the applicable air quality plan,
- ▶ violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- ▶ result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is nonattainment under any applicable national or state ambient air quality standards (PCAPCD has adopted an operational cumulative threshold of 10 lb/day of ROG or NO<sub>x</sub>, to apply during summer months only),
- ▶ expose sensitive receptors to substantial pollutant concentrations, or
- ▶ create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the State CEQA Guidelines, the significance of criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations.

Thus, based on recommendations by PCAPCD, the proposed project would result in a potentially significant impact on air quality if:

- ▶ construction-generated criteria air pollutant or precursor emissions would exceed the PCAPCD-recommended threshold of 82 pounds per day (lb/day) for ROG, NO<sub>x</sub>, or PM<sub>10</sub>,
- ▶ long-term operational (regional) criteria air pollutant or precursor emissions would exceed the PCAPCD-recommended threshold of 82 lb/day for ROG, NO<sub>x</sub>, or PM<sub>10</sub>, or
- ▶ long-term operational local mobile-source CO emissions would violate or contribute substantially to concentrations that exceed the California 1-hour ambient air-quality standard of 20 ppm or the 8-hour standard of 9 ppm.

Neither the ARB nor any air district in California, including the PCAPCD, has identified a significance threshold for analyzing GHG emissions generated by a proposed project or a methodology for analyzing air quality impacts related to global warming. Though, by adoption of AB 32, the State of California has identified GHG reduction goals, the effect of increased GHG emissions as they relate to global climate change is inherently an adverse environmental impact. While the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in an impact with respect to global climate change.

To meet AB 32 goals, California would need to generate less GHG than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels.

While AB 32 focuses on stationary sources of GHG emissions, the primary objective of AB 32 is to reduce California’s contribution to global climate change by reducing California’s total annual production of GHG emissions. The impact that GHG emissions have on global climate change is not dependent on whether they were generated by stationary, mobile, or area sources; or whether they were generated in one region or another. Thus, the net change in total GHG levels generated by a project or activity is the best metric for determining whether the proposed project would contribute to climate change. The impacts of the proposed project on global climate change are addressed in the cumulative section of Chapter 16.0, “Other CEQA-Required Sections,” because the project by itself would not cause a noticeable change in global climate change.

### 9.3.3 IMPACT ANALYSIS

IMPACT 9-1	<i>Air Quality – Short-Term Construction-Generated Emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub>. Site preparation and other trail construction activities would result in the temporary generation of ROG, NO<sub>x</sub>, and PM<sub>10</sub> emissions. However, daily unmitigated emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> would not exceed PCAPCD’s significance thresholds.</i>
Significance	<i>Less Than Significant</i>
Mitigation Proposed	<i>None Warranted</i>
Residual Significance	<i>Less Than Significant</i>

Construction emissions are described as “short term” or temporary in duration and have the potential to represent a significant impact with respect to air quality, especially emissions of fugitive dust (PM<sub>10</sub>). Fugitive dust emissions are associated primarily with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of the disturbance area, and miles traveled by construction vehicles

on-site and off-site. ROG and NO<sub>x</sub> emissions are associated primarily with gas and diesel equipment exhaust and the application of architectural coatings.

Construction of the proposed trail would result in the temporary generation of ROG, NO<sub>x</sub>, and PM<sub>10</sub> emissions from site preparation, compaction, motor vehicle exhaust associated with construction equipment, employee commute trips, material transport (especially on unpaved surfaces), and other trail construction activities. The trail would be constructed by both hand and mechanical construction techniques. The proposed project would include various construction activities, including removal of surface vegetation, grading and filling activities, vehicle travel on paved and unpaved roads, and material hauling. The proposed Foresthill Bridge Staging Terminus would require minimal improvements, including light grading and fence installation. The proposed Ponderosa Way Staging Terminus would require cutting and filling, compaction, and grading. A bulldozer, vibrating compactor, backhoe, and motor grader would be required for construction of the staging termini. Trail construction would likely involve use of a Sweco trail dozer, mini excavator, and other machinery capable of conforming to dimensional requirements of the trail.

Construction of all trail segments would require approximately 3 years, assuming a 12-person crew working 7 hours per day. Short-term construction-generated emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> were modeled using air pollutant emission factors recommended by PCAPCD, ARB, and EPA (ARB 2003, EPA 1995); default parameters and project-specific information (e.g., number and type of construction equipment) were used where available. Based on the modeling conducted, in the worst-case scenario construction of the proposed trail would result in maximum unmitigated daily emissions of approximately 11.28 lb/day of ROG, 77.90 lb/day of NO<sub>x</sub>, and 34.25 lb/day of PM<sub>10</sub> (refer to Appendix D for detailed modeling assumptions, input, and results). Daily unmitigated emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> would not exceed PCAPCD's significance threshold of 82 lb/day. Thus, construction-generated emissions would not be anticipated to violate an air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered less than significant.

<b>IMPACT</b> 9-2	<b>Air Quality – Long-Term Operational (Regional) Emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub>.</b> <i>Implementation of the proposed project may result in area-source emissions from trail landscape maintenance activities and could result in additional vehicle trips on local roadways from an increase in visitors to the trail. However, long-term operational emissions would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with PCAPCD's air quality planning efforts.</i>
<b>Significance</b>	<i>Less Than Significant</i>
<b>Mitigation Proposed</b>	<i>None Warranted</i>
<b>Residual Significance</b>	<i>Less Than Significant</i>

Long-term operation of the proposed project (i.e., use and maintenance of the proposed trail) would not result in the use of any new stationary sources of emissions in the project area. Implementation of the proposed project may result in area-source emissions from trail landscape maintenance activities. In addition, the proposed project could result in additional vehicle trips on local roadways from an increase in visitors to the Auburn State Recreation Area (SRA). However, trail maintenance activities would be minimal, in most instances not requiring mobilized or mechanical equipment, and a majority of vehicle trips are anticipated to be generated by current visitors of the Auburn SRA (see Impact 8-2, "Increase in Traffic with Use of the North Fork Trail," in Chapter 8.0, "Transportation and Circulation"). Daily unmitigated emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> would not be anticipated to exceed the PCAPCD significance threshold of 82 lb/day. Thus, long-term operational emissions would not be anticipated to violate an air quality standard, contribute substantially to an existing or projected air

quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with PCAPCD's air quality planning efforts. As a result, this impact is considered less than significant.

**IMPACT 9-3**      **Air Quality – Exposure of Sensitive Receptors to Toxic Air Contaminant Emissions or Asbestos.** *Construction of the proposed trail would result in short-term emissions of diesel exhaust from on-site heavy-duty equipment. However, the use of mobilized equipment would be temporary (approximately 2% of the exposure period) and would combine with the highly dispersive properties of diesel PM; furthermore, no sensitive receptors are located within 2 miles of the site. Therefore, short-term construction activities and long-term use and maintenance would not expose sensitive receptors to substantial pollutant concentrations. In addition, the project area is not located in an area that is likely to contain naturally occurring asbestos.*

**Significance**      *Less Than Significant*

**Mitigation Proposed**      *None Warranted*

**Residual Significance**      *Less Than Significant*

Construction of the proposed trail would result in short-term emissions of diesel exhaust from on-site heavy-duty equipment. Particulate exhaust emitted from diesel-fueled engines (diesel PM) was identified as a TAC by ARB in 1998. Diesel PM emissions would be generated during trail construction from the use of off-road diesel equipment for site grading and excavation, and from other construction activities. The dose to which receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the state Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (Salinas, pers. comm., 2004). In addition, since diesel PM is known to be highly dispersive, emissions would diffuse rapidly from the source, thus resulting in lower concentrations to which receptors could be exposed (Zhu et al. 2002). Thus, because the use of mobilized equipment would be temporary (approximately 2% of the exposure period) and would combine with the dispersive properties of diesel PM, and because no sensitive receptors are located within 2 miles of the site, short-term construction activities would not expose sensitive receptors to substantial pollutant concentrations. In addition, the long-term operation of the proposed project (i.e., use and maintenance of the proposed trail) would not require the use of any major stationary sources of TAC emissions (e.g., emergency backup generators), and there are no existing stationary sources of TACs in the vicinity of the project area (ARB 2005b).

In addition, naturally occurring asbestos, often found in serpentine rock formations, is present in several foothill areas of Placer County. When material containing naturally occurring asbestos is disturbed, asbestos fibers may be released and become airborne, thereby creating a potential health hazard. According to *Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California* (Higgins and Clinkenbeard 2006) and *A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill and Hill 2000), the project area is not located in an area that is likely to contain naturally occurring asbestos. As a result, this impact is considered less than significant.

<b>IMPACT</b> 9-4	<b>Air Quality – Long-Term Operational (Local) Mobile-Source Emissions of Carbon Monoxide.</b> <i>The proposed project could result in additional vehicle trips on local roadways from an increase in visitors to the trail. However, a majority of such vehicle trips would be anticipated to be generated by current visitors of the Auburn SRA. Long-term operational emissions of CO would not be anticipated to violate or contribute substantially to an air quality violation.</i>
Significance	<i>Less Than Significant</i>
Mitigation Proposed	<i>None Warranted</i>
Residual Significance	<i>Less Than Significant</i>

As stated in Chapter 3.0, “Project Description,” the proposed project could result in additional vehicle trips on local roadways from an increase in visitors to the trail; however, a majority of such vehicle trips are anticipated to be generated by current visitors of the Auburn SRA. Thus, long-term operational (local) mobile-source emissions of CO would not be anticipated to violate or contribute substantially to concentrations that exceed the California 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm. As a result, this impact is considered less than significant.

<b>IMPACT</b> 9-5	<b>Air Quality – Exposure of Sensitive Receptors to Odor Emissions.</b> <i>Construction of the proposed trail would result in emissions of diesel exhaust from on-site construction equipment. However, these emissions would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance.</i>
Significance	<i>Less Than Significant</i>
Mitigation Proposed	<i>None Warranted</i>
Residual Significance	<i>Less Than Significant</i>

The occurrence and severity of odor impacts depend on numerous factors: the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they can still be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Construction of the proposed trail would result in emissions of diesel exhaust from on-site construction equipment. These emissions would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. In addition, no existing sources of odors are located in the vicinity of the project area, and the proposed project would not include the long-term operation of any new sources of odor. Thus, the operation of the proposed project (i.e., use and maintenance of the proposed trail) would not create objectionable odors affecting a substantial number of people. As a result, this impact is considered less than significant.

## 9.4 MITIGATION MEASURES

No mitigation measures are necessary.