4.11 AIR QUALITY

4.11.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Regional Setting & Climate
- Existing Air Quality Conditions
- Air Basin Plans

This section of the EIR evaluates the potential impacts on air quality resulting from the implementation of the proposed *General Plan 2030*. Air quality modeling was conducted by Donald Ballanti, certified meteorologist, and results used in this section are provided in Appendix E.

REGULATORY SETTING

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

Federal Regulations

The federal Clean Air Act (CAA) and its amendments establish the National Ambient Air Quality Standards (NAAQS). These standards identify levels of air quality for "criteria" pollutants that are regarded as the maximum levels of ambient (background) air pollutants considered to have an adequate margin of safety needed to protect the public health and welfare. The "criteria pollutants" are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2 is a form of NO_x), sulfur oxides (SO_2 is a form of SO_x), particulate matter less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively) and lead. The U.S. Environmental Protection Agency (EPA) Region IX office oversees compliance with the FCAA.

State Regulations

CALIFORNIA CLEAN AIR ACT

The California Air Resources Control Board (CARB), a department of the California Environmental Protection Agency (CalEPA), oversees air quality planning and control throughout California. Its responsibility lies with ensuring compliance with the California Clean Air Act (CCAA) and its amendments, as well as responding to the FCAA requirements and regulating

emissions from motor vehicles sold in California. It also sets fuel specifications to further reduce vehicular emissions. The amendments to the CCAA establish California Ambient Air Quality Standards (CAAQS) and a legal mandate to achieve these standards by the earliest practicable date. These standards apply to the same criteria pollutants as the FCAA and also include sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride.

TOXIC AIR CONTAMINANTS

In addition to the California's Ambient Air Quality Standards, toxic air contaminants (TACs) are other pollutants that include carcinogens and noncarcinogens. California regulates TACs through its air toxics program and Air Toxics "Hot Spots" Information and Assessment of the Health and Safety Code. The CARB identifies TACs in conjunction with the State Office of Environmental Health Hazard Assessment (OEHHA). Air quality control agencies, including the Monterey Bay Unified Air Pollution Control District (MBUAPCD), must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by CARB.

Diesel particulate matter was identified as a toxic air contaminant (TAC) by the state of California in 1998. The CARB developed a comprehensive strategy to control diesel PM emissions, including preparation of the "Diesel Risk Reduction Plan." Once the Diesel Risk Reduction Plan was adopted, the CARB started developing emission regulations for a number of categories of in-use diesel vehicles and equipment. An important part of the Diesel Risk Reduction Plan is a series of measures for various categories of in-use on- and off-road diesel engines, which are generally based on the following types of controls:

- Retrofitting engines with emission control systems, such as diesel particulate filters or oxidation catalysts,
- Replacement of existing engines with new technology diesel engines or natural gas engines, and
- Restrictions placed on the operation of existing equipment.

Regional Regulations

Regulatory oversight for air quality in the North Central Coast Air Basin ("Basin"), in which the City of Santa Cruz is located, rests at the regional level with the Monterey Bay Unified Air Pollution Control District (MBUAPCD), the CARB at the State level, and the U.S. EPA Region IX office at the Federal level. The MBUAPCD is one of 35 air districts established to protect air quality in California. The North Coast Basin is comprised of Santa Cruz, Monterey and San Benito Counties.

The CCAA requires each nonattainment district in the state to adopt a plan showing how the State Ambient Air Quality Standard for ozone would be met. The CCAA required initial preparation of an Air Quality Management Plan (AQMP) in 1991, with subsequent updates every three years. The MBUAPCD adopted its first AQMP in 1991; the current plan was adopted by the Air District in August 2008.

The MBUAPCD has primary responsibility for local air quality by controlling air pollution from stationary sources of air pollution. The District has adopted a number of rules affecting both stationary and area-wide sources of emissions for the purpose of achieving the State and federal AAQS for ozone.

The MBUAPD also regulates TACs from new or modified sources under Rule 1000 and a Board approved protocol that applies to any source which requires a permit to construct or operate pursuant to District regulations and has the potential to emit carcinogenic or noncarcinogenic TACs. The District's Rule 1000 also requires sources of carcinogenic TACs to install best control technology and reduce cancer risk to less than one incident per 100,000 population. Sources of noncarcinogenic TACS must apply reasonable control technology. The District also implements Rule 1003, Air Toxic Emissions Inventory and Risk Assessments, which establishes and implements the Air Toxics Hot Spots Act. Rule 1003 also requires that any increased cancer risk resulting from an existing facility's emissions is less than one incident per 100,000 population (Monterey Bay Unified Air Pollution Control District, February 2008).

Local Regulations

The City of Santa Cruz addresses odors and pollutants in its Municipal Code. Section 24.14.264 prohibits emission of odorous gases or matter in quantities readily detectable. Section 24.14.272 prohibits emissions from any source that exceed permissible amounts or limits established by the Monterey Bay Unified Air Pollution Control District.

REGIONAL SETTING & CLIMATE

The North Central Coast Air Basin (NCCAB), which is just south of the San Francisco Bay Area Air Basin, covers an area of 5,159 square miles and consists of the counties of Santa Cruz, San Benito, and Monterey. Topography and meterology heavily influence air quality. In the project vicinity, the northwest sector of the basin is dominated by the Santa Cruz Mountains. In Santa Cruz County, coastal mountains exert a strong influence on atmospheric circulation, which results in generally good air quality. Small inland valleys such as Scotts Valley with low mountains on two sides have poorer circulation than at Santa Cruz on the coastal plain. In addition, Scotts Valley is downwind of major pollutant generating centers, and these pollutants have time to form oxidants during transit to Scotts Valley. Consequently, air pollutants tend to build up more at Scotts Valley than at Santa Cruz (Monterey Bay Air Pollution Control District February 2008).

The semi-permanent high pressure cell in the eastern Pacific is the basic controlling factor in the climate of the air basin. In the summer, the high pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement (Monterey Bay Air Pollution Control District February, 2008).

The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low pressure which intensifies the onshore air flow during the afternoon and evening. In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay area or the Central Valley into the NCCAB (Monterey Bay Air Pollution Control District February 2008).

During the winter, the Pacific High migrates southward and has less influence on the air basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin as a whole in winter and early spring. (Monterey Bay Air Pollution Control District February 2008).

EXISTING AIR QUALITY CONDITIONS

Ambient Air Quality Standards

Ambient air quality standards (AAQS) are set to establish levels of air quality that must be maintained to protect the public from the adverse effects of air pollution. State standards are established to protect public health, including the most sensitive members of the population. National standards include a primary standard to protect public health and a secondary standard to protect the public welfare including property, vegetation and visibility. However, the numerical values for both standards are the same (Monterey Bay Unified Air Pollution Control District, August 2008).

As indicated above, the federal and state governments have established AAQS for six "criteria" pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than or equal to 10 microns in diameter (PM_{10}) and 25 microns in diameter (PM_{25}), and (SO_2), particulate matter smaller than or equal to 10 microns in diameter (PM_{10}) and 25 microns in diameter (PM_{25}), and lead. As indicated above, the state standards also include sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. Current state and national AAQS are shown in Table 4.11-1.

TABLE 4.11.1
National and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[b]		National Standards[c]			
				Primary[d]		Secondary[e]	
		ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Ozone	1 hour	0.09	180	None[f]		None	
	8 hours	0.070	137	0.08[g]		0.08	
				0.075[h]		0.075	
Carbon Monoxide	8 hours	9.0	10,000	9	10,000	9.0	10,000
	1 hour	20	23,000	35	40,000	35.0	40,000
Nitrogen Dioxide[i]	Annual	0.030	56	0.053	100	0.053	100
	1 hour	0.18	338				
Sulfur Dioxide	Annual			0.03	80		
	24 hours	0.04	105	0.14			
	3 hours					0.5	1,300
	1 hour	0.25	655				
Respirable Particulate Matter (PM_{10})[j]	Annual		20		50		50
	24 hours		50		150		150
Fine Particulate Matter ($PM_{2.5}$)[l]	Annual		12		15		15
	24 hours				35		35
Lead	Calendar quarter				1.5		1.5
	30-day avg		1.5				
Sulfate	24 hours		25				
Hydrogen Sulfide	1 hour	0.03	42				
Vinyl Chloride	24 hours	0.010	26				
Visibility Reducing Particles	8 hours (10 a.m.- 6 p.m.)	In sufficient amounts to reduce prevailing visibility to < 10 miles when relative humidity of < 70% with equivalent instrument method					

[a] Standards first promulgated in ppm concentrations except where noted. Equivalent µg/m³ concentrations based on reference temperature of 25°C and reference pressure of 760 mm of mercury.
[b] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide, nitrogen dioxide, PM_{10}, and visibility reducing particles are values not to be exceeded.
[c] National standards, other than ozone and those based on annual averages, are not to be exceeded more than once a year.
[d] Designed to protect human health with an adequate margin of safety
[e] Designed to protect public welfare (i.e., prevent damage to vegetation, property, visibility)
[f] On June 15, 2005, EPA revoked the 1-hour standard in the NCCAB.
[g] 1997 Standard – The standard and related implementation rules remain in place during transition to the 2008 8-hour ozone standard.
[h] 2008 Standard - Adopted March 12, 2008.
[i] On February 22, 2007, the Air Resources Board approved staff recommendations to amend the State nitrogen dioxide standard.
[j] PM_{10} refers to respirable particulate matter less than 10 microns in size.
[l] $PM_{2.5}$ refers to respirable particulate matter less than 2.5 microns in size.

Source: Monterey Bay Unified Air Pollution Control District, August 2008

Criteria Air Pollutants

OZONE

Ozone, the primary constituent of smog, is not directly emitted but is formed in the atmosphere over several hours from combinations of various precursors in the presence of sunlight. Nitrogen oxides (NO_x) and volatile organic compounds (VOCs) are considered to be the primary compounds, or precursors, contributing to the formation of ozone. Ozone is viewed as both a secondary pollutant and a regional pollutant. The primary sources of VOC within the planning area are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. The primary sources of NOx are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes (Monterey Bay Unified Air Pollution Control District, August 2008). Short-term exposure to ozone results in injury and damage to the lung, decreases in pulmonary function, and impairment of immune mechanisms (Ibid.).

In 2008, daily emissions of VOC and NO_x in the NCCAB were estimated at 76 and 79 tons, respectively, with on-road mobile sources constituting 23% of VOC and 49% of NOx emissions (Monterey Bay Unified Air Pollution Control District, February 2008).

INHALABLE PARTICULATES

Inhalable Particulates refer to particulate matter less than 10 microns in diameter (PM_{10} and $PM_{2.5}$). In 1997, EPA adopted a fine particulate matter standard of 2.5 microns or less in diameter ($PM_{2.5}$), and CARB adopted an annual $PM_{2.5}$ standard in 2002. PM_{10} and $PM_{2.5}$ are respirable particulate matter that are classified as primary or secondary depending on their origin. Primary particles are unchanged after being directly emitted (e.g., road dust) and are the most commonly analyzed and modeled form of PM_{10}. Because it is emitted directly and has limited dispersion characteristics, this type of PM_{10} is considered a localized pollutant. In addition, secondary PM_{10} can be formed in the atmosphere through chemical reactions involving gases.

PM_{10} and $PM_{2.5}$ are respirable particulate matter and because of their small size, they can be inhaled deep into the lungs and are therefore a health concern. Key health effects categories associated with PM include: premature mortality; aggravation of respiratory and cardiovascular disease; changes in lung function and increased respiratory symptoms; and altered respiratory defense mechanisms (Monterey Bay Unified Air Pollution Control District, February 2008).

Major sources of primary particles include fugitive dust from roads and agricultural operations. Secondary particulates are formed in the atmosphere largely by chemical reactions involving gases, e.g., sulfate from directly emitted sulfur oxides. Natural sources of particulates include sea spray, forest fires, volcanic debris, etc. Man-made sources include fuel combustion, industrial processes and transportation. In 2005 daily emissions of PM_{10} were estimated at 102 tons per day. Of this, entrained road dust represented 35% of all PM_{10} emission, windblown dust 20%, ag tilling operations 15%, waste burning 17%, construction 4%, and mobile sources, industrial processes, and other sources made up 9%. Dust is termed "fugitive" when dust escapes into the atmosphere via a non-stack source. This includes wind blown dust from disturbed soil surfaces,

construction sites, agricultural tilling activities, aggregate processing operations and dust raised by vehicles traveling on paved and unpaved roads (Monterey Bay Unified Air Pollution Control District, February 2008).

CARBON MONOXIDE (CO)

Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. Because it is directly emitted from combustion engines, carbon monoxide can have adverse localized impacts, primarily in areas of heavy traffic congestion. Because it is emitted directly and has limited dispersion characteristics, CO is considered a localized pollutant (Monterey Bay Unified Air Pollution Control District, February 2008).

When carbon monoxide combines with hemoglobin in the blood, the oxygen-carrying capacity of the blood is reduced and the release of oxygen is inhibited or slowed. This condition puts the following at risk: patients with angina, persons with other cardiovascular diseases, chronic obstructive lung disease, or asthma; persons with anemia, and fetuses. At higher levels, CO also affects the central nervous system. Symptoms of exposure may include headaches, dizziness, sleepiness, nausea, vomiting, confusion, and disorientation (Monterey Bay Unified Air Pollution Control District, February 2008). At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause unconsciousness and death.

Carbon monoxide emissions in the NCCAB were estimated at 446 tons per day in 2005 with motor vehicles contributing approximately 47% of total emissions. Electric utilities, fires, and other mobile and miscellaneous sources contributed to the remainder (Monterey Bay Unified Air Pollution Control District, February 2008).

OTHER POLLUTANTS

Toxic Air Contaminants. Toxic air contaminants (TACs) are other pollutants that include carcinogens and noncarcinogens which may be expected to result in an increase in mortality or serious illness or pose hazards to human health. There are hundreds of different types of TACs, with varying degrees of toxicity. Additionally, some of the TACs may cause other health effects over short- or long-term exposure. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle engine exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset spill conditions. Health effects of TACs include cancer, birth defects, neurological damage and death. TACs can cause various cancers, depending on the particular chemicals, their type and duration of exposure.

Diesel Particular Matter. Diesel particulate matter was identified as a toxic air contaminant (TAC) by the state of California in 1998. Mobile sources (including trucks, buses, automobiles, trains, ships and farm equipment) are by far the largest source of diesel emissions. Following the identification of diesel as a TAC, the California Air Resources Board developed a comprehensive strategy to control diesel PM emissions. The "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles"—a document approved by ARB in September 2000—set goals to reduce diesel PM emissions in California by 75% by 2010 and 85% by 2020. This objective would be achieved by a combination of approaches

(including emission regulations for new diesel engines and low sulfur fuel program). An important part of the Diesel Risk Reduction Plan is a series of measures for various categories of in-use on- and off-road diesel engines, which are generally based on the following types of controls:

- Retrofitting engines with emission control systems, such as diesel particulate filters or oxidation catalysts,
- Replacement of existing engines with new technology diesel engines or natural gas engines, and
- Restrictions placed on the operation of existing equipment.

Once the Diesel Risk Reduction Plan was adopted, the ARB started developing emission regulations for a number of categories of in-use diesel vehicles and equipment. In July 2007, the ARB adopted regulations for in-use, off-road diesel vehicles that will significantly reduce particulate matter emissions by requiring fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits.

Odors. Odors represent emissions of one or more pollutants that are a nuisance to healthy persons and may trigger asthma episodes in people with sensitive airways. Pollutants associated with objectionable odors include sulfur compounds and methane. Typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries. Odors are a complex problem that can be caused by minute quantities of substances (Monterey Bay Unified Air Pollution Control District, February 2008). Because people have mixed reactions to odors, the nuisance level of an odor varies.

Local Ambient Air Quality & Attainment Status

Ambient air quality is monitored at nine stations within the NCCAB. The network includes seven stations operated by the MBUAPCD, one station operated by the National Park Service at the Pinnacles National Monument and one station operated by an industry group in King City. The monitoring stations operated by the MBUAPCD are part of the State and Local Air Monitoring Systems (SLAMS) network, and are located in Salinas, Hollister, Santa Cruz, Watsonville, Scotts Valley and Carmel Valley. The stations operated at Davenport, King City and Pinnacles are referred to as Special Purpose sites because they provide information on the impact of specific sources, or to gauge air quality impacts on national resources, such as national Parks (Monterey Unified Air Pollution Control District, August 2008). The nearest monitoring stations to the city of Santa Cruz are the Davenport and Santa Cruz monitoring stations; the Santa Cruz station is located in Soquel.

Designations in relation to state standards are made by the CARB while designations in relation to national standards are mad by the EPA. State designations are updated annually while the national designations are updated when either the standards change or when an area requests re-designation due to changes in air quality. Designations are made by air basin and in some cases, designations are made at the county level (Monterey Unified Air Pollution Control District, August 2008). Designations are made for each criteria pollutant according to the categories listed below. Nonattainment designations are of most concern because they indicate that

unhealthy levels of the pollutant exist in the area, which typically triggers a need to develop a plan to achieve the applicable standards (Ibid.).

- **Attainment** – Air quality in the area meets the standard.
- **Nonattainment Transitional** – Air quality is approaching the standard (State only).
- **Nonattainment** – Air quality in the area fails to meet the applicable standard.
- **Unclassified** – Insufficient data to designate area or designations have yet to be made.

Table 4.11-2 summarizes the attainment status for criteria pollutions in the NCCAB. The Basin is currently in attainment for the federal PM_{10} standard and state and federal nitrogen dioxide, sulfur dioxide and carbon monoxide standards. The basin is considered attainment or unclassified for other national standards and non-attainment for the 1-hour state ozone standard and for the state PM_{10} standard. The NCCAB does not meet the State PM_{10} standard although it is in attainment for the state $PM_{2.5}$ standard.

TABLE 4.11-2
Attainment Status for the North Central Coast Air Basin – January 2009

Pollutant	State	Federal
Ozone (O_3)	**Nonattainment** [1]	Attainment [2]
Inhalable Particulates (PM_{10})	**Nonattainment**	Attainment
Fine Particulates ($PM_{2.5}$)	Attainment	Unclassified/Attainment [3]
Carbon Monoxide (CO)	Monterey Co. – Attainment San Benito Co. – Unclassified Santa Cruz Co. - Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Unclassified/Attainment [4]

[1] Effective July 26, 2007, the ARB designated the NCCAB a nonattainment area for the State ozone standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.
[2] On March 12, 2008, EPA adopted a new 8-hour ozone standard of 0.075 ppm, while temporarily retaining the existing 8-hour standard of 0.08 ppm. EPA is expected to issue new designations by March 2010.
[3] In 2006, the Federal 24-hour standard for PM2.5 was revised from 65 to 35 ☐g/m3. Although final Designations have yet to be made, it is expected that the NCCAB will remain designated unclassified/attainment.
[4] On October 15, 2008 EPA substantially strengthened the national ambient air quality standard for lead by lowering the level of the primary standard from 1.5 ☐g/m3 to 0.15 ☐g/m3. Initial recommendations for designations are to be made by October 2009 with final designations by January 2012.

SOURCE: Monterey Bay Unified Air Pollution Control District website: http://www.mbuapcd.org/programs/planning

In 1997, a federal 8-hour ozone standard of 0.08 ppm was adopted by EPA. This standard replaced the prior federal 1-hour standard. In 2004, the NCCAB was designated as an attainment area for the federal 8-hour standard with an obligation to develop a maintenance plan. Maintenance of the federal standard is addressed in the District's 2007 Federal

Maintenance Plan for the Monterey Bay Region, which was adopted in March of 2007 (Monterey Bay Unified Air Pollution Control District, August 2008), and is summarized further below in the "Regional Plans" subsection.

In 2006, the CARB revised the State AAQS for ozone to include an eight-hour average of 0.070 ppm, while retaining the existing one-hour standard at 0.09 ppm. This standard is more stringent than the federal standard both in terms of concentration and the level of precision. Both the one and eight-hour components of the State standard must be met in order for the standard to be achieved. The NCCAB is a nonattainment area for the State standard (Monterey Bay Unified Air Pollution Control District, August 2008).

The state 8-hour standard is more protective of public health than both the prior 1-hour standard and the national 8-hour standard. With natural background representing about half the level of the stringent 8-hour ozone standard, the introduction of the 8-hour average significantly increases the number of exceedances recorded at the District's monitoring stations (Monterey Bay Unified Air Pollution Control District, August 2008). Overall, there has been a declining trend in exceedances, although there can be considerable year–to-year variation, particularly for 8-hour exceedances. The year-to-year variations tend to be driven by year-to-year variations in weather, while the overall decline tends to be driven by a reduction in emissions across the region. The majority of the exceedance days (<80% based on 2003 to 2005 data) occur at Pinnacles (Ibid.).

As previously indicated, ozone is formed by a photochemical reaction between volatile organic compounds and the oxides of nitrogen in the presence of sunlight. Consequently, ozone tends to be seasonal pollutant which develops primarily in the summertime when the sunlight is strongest. Statewide, the "ozone season" is considered the months May through October. Most NCCAB exceedances follow the typical May through October pattern (Monterey Bay Unified Air Pollution Control District, August 2008). However, with the introduction of the 8-hour state standard, exceedances become much more frequent and start as early as April. While the seasonal exceedance patterns for both the 1 and 8-hour criteria are similar, the 8-hour standard greatly increases the number of exceedances and causes the ozone season to start earlier (Ibid.).

Sensitive Receptors

A sensitive receptor is generically defined as any residence including private homes, condominiums, apartments, and living quarters; education facilities such as preschools and kindergarten through grade twelve (k-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. Sensitive receptors include long-term care hospitals, hospices, prisons, and dormitories or similar live-in housing. The MBUAPCD's "CEQA Guidelines" include identification of sensitive receptors in the vicinity of a project site as part of the CEQA review with an analysis of whether a project would expose sensitive receptors to significant amounts of pollution as a part of the CEQA analysis for proposed projects. This includes sensitive receptors near roadways and intersections that could be significantly impacted by the project's traffic and carbon monoxide emissions.

As discussed in the LAND USE (Chapter 4.1) section of this EIR, nearly 40% of existing land uses within the city are residential, which would be considered sensitive receptors. Other sensitive

receptors include schools, daycare centers and health care facilities throughout the city. There are no hospitals located within city limits.

AIR BASIN PLANS

Air Quality Management Plan

The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the California Clean Air Act of 1988 that established specific planning requirements to meet the ozone standard. The Act requires that the AQMP be updated every three years. The current AQMP, adopted in 2008, is the fifth update to the 1991 AQMP with the first four updates completed in 1994, 1997, 2000 and 2004, respectively.

The air basin is a nonattainment area for the State Ambient Air Quality Standards for both ozone and inhalable particulate matter (PM_{10}). The AQMP addresses only attainment of the State ozone standard. Attainment of the State PM_{10} standard is addressed in the District's plan Particulate Plan, which was adopted in December 2005 and is summarized further below. Maintenance of the national eight-hour standard for ozone is addressed in the District's "Federal Maintenance Plan for the Monterey Bay Region", which was adopted in March 2007 and also is summarized below.

The 2008 AQMP is a transitional plan shifting focus of the MBUAPCD's efforts from achieving the 1-hour component of the State AAQS to achieving the new 8-hour requirement. The plan includes an updated air quality trends analysis, which now reflects both the 1- and 8-hour standards, as well as an updated emission inventory, which includes the latest information on stationary, area and mobile emission sources (Monterey Bay Unified Air Pollution Control District, August 2008).

The AQMP's emission inventory, a key component of the plan, is an estimate of the amount of ozone precursors emitted into the air each day by man-made (anthropogenic) activities. The inventory represents emissions of VOCs and NOx (tons per day) on a typical weekday during the May through October ozone season. The inventory includes stationary sources, area-wide sources and mobile sources. Stationary sources include typically large facilities such as power plants or cement plants, while area-wide sources include an aggregate of individually smaller sources, which when grouped together have significant emissions such as consumer products or residential fuel consumption. Mobile sources consist of the numerous cars and trucks that travel the streets and highways of the NCCAB, as well as other mobile sources such as off-road agricultural and construction equipment, trains and aircraft (Monterey Bay Unified Air Pollution Control District, August 2008).

The emissions forecasts consider growth factors, such as population, housing, employment, industrial output, vehicle miles traveled, etc., developed by state and local agencies, such as AMBAG. These growth factors are used to estimate forces which increase emissions, while "control factors" estimate the offsetting effect of emissions controls (Monterey Bay Unified Air Pollution Control District, August 2008). The AQMP indicates that despite a significant overall increase in population of over 360,000 persons within the NCCAB between 1990 and 2030 (59% increase), emissions are expected to decrease by over 130 tons/day (55% decrease).

This demonstrates a major success for regional control strategies in that despite a significant increase in population, emissions are expected to decline significantly. This is largely due to reductions in tail-pipe emissions from motor vehicles as well as the application of clean air technologies on power plants (Ibid.).

The 2008 AQMP includes five control measures from the 2004 AQMP, whose development was put on hold pending our progress toward achieving the 1-hour standard. Since the introduction of the 8-hour standard the area has reverted to nonattainment, the 2008 AQMP proposes to follow through on development of these previously adopted measures. The five measures include:

- A1 - Solvent Cleaning Operations
- A2 - Degreasing Operations
- A3 - Spray Booths - Miscellaneous Coatings and Cleanup Solvents
- A4 - Adhesives and Sealants
- A5 - Natural Gas-Fired Fan-Type Central Furnaces and Residential Water Heaters

The 2008 AQMP also updates the description of the area's Transportation Control Measures (TCMs) and mobile source emission reduction programs. The AQMP further proposes to evaluate any co-pollutant benefits in terms of reducing ozone precursors achieved under climate change bill AB 32.

Federal Maintenance Plan

The "Federal Maintenance Plan" (May 2007) plan presents the strategy for maintaining the NAAQS for ozone in the NCCAB. It is an update to the 1994 Federal Maintenance Plan, which was prepared for maintaining the 1-hour NAAQS for ozone that since has been revoked and is superseded by the current 8-hour ozone standard. Effective June 15, 2004, the U.S. EPA designated the NCCAB as an attainment area for the 8-hour NAAQS for ozone. The plan includes an emission inventory for the years 1990 to 2030 for VOC and NO_X, the two primary ozone precursor gases as explained above. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (Monterey Bay Unified Air Pollution Control District, May 2007).

Particulate Matter Plan

The purpose of the "Particulate Matter Plan" (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the California Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction wit local air pollution control districts, to adopt a list of the most readily available, feasible and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (Monterey Bay Unified Air Pollution Control District, December 2005). The Plan's proposed activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the Air District's Smoke Management and emission reduction incentive programs.

The Plan includes review of the basin's air monitoring emissions data with characterization of sources that likely cause or contribute to monitored violations of the standard in the NCAAB. The major cause of exceedances in the NCCAB is naturally occurring sea salt, without which, three quarters of all exceedances in the NCCAB would not have occurred (Monterey Bay Unified Air Pollution Control District, December 2005). There are no planning requirements associated with sea salt, and the remaining exceedances are relatively infrequent and not substantially above the standard (Ibid.).

For the smaller group of exceedances which remain where sea salt was not a major contributor, the causes were likely related to fugitive dust from a variety of sources, including entrained road dust, especially from unpaved roads, wind blow dust from disturbed soil and unpaved surfaces, construction activities and agricultural sources and exposed agricultural lands (Monterey Bay Unified Air Pollution Control District, December 2005). Fugitive dust from cement manufacturing and handling, as well as smoke form wildland fires, also contribute to exceedances of the standard at times (Ibid.).

4.11.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address natural resources and several address air quality in particular. Policy LU1.2 seeks to prevent air pollution from new development, and Policy HZ2.1 strives to exceed air standards. Policy HZ2.2 and its associated actions address localized air quality issues, including indoor air quality, and sets forth directives to require air quality mitigations for new projects and major indirect sources of air pollution.

Goal NRC4 with its four polices and accompanying actions address climate change to attain greenhouse emissions reductions goals, which is reviewed in the GLOBAL CLIMATE CHANGE (Chapter 4.12) section of this EIR. Additionally, a number of policies are directed to reducing automobile trips and creating sustainable development and land use patterns, which would also result in reduction of automobile trips, and thus, emissions as reviewed in the TRAFFIC AND TRANSPORTATION (Chapter 4.4) section of this EIR.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites: Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site. The Swenson and Golf Club Drive sites are designated for residential uses. A 5.5-acre parcel immediately south of and adjacent to the

City's Landfill and Resource Recovery Center on Dimeo Lane is proposed to be annexed to the City. It is expected that future uses would be ancillary to the landfill and Resource Recovery Center uses; specific uses have not yet been identified and will be determined in the future. However, the parcel is not planned for expansion of the landfill disposal operations (Arman, personal communication, April 2010).

The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development and/or intensified redevelopment. Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.4). Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. Action ED4.2.2 seeks to "preserve existing and seek new industries and businesses at the cutting edge of science and technology."

The *General Plan 2030* supports some specified new or improved community facilities. The draft plant supports development of a desalination plant (LU3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (see the WATER SUPPLY [Chapter 4.5] section of this EIR for further discussion of the planned desalination facility).

4.11.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

11a Conflict with or obstruct implementation of the air quality management plan;

11b Violate any air quality standards or contribute substantially to an existing or projected air quality violation;

11c Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;

11d Expose sensitive receptors (i.e. residents, schools, hospitals) to substantial pollutant concentrations, i.e. those that exceed the MBUAPCD standards identified above and/or toxic air contaminants that exceed health exposure rates; or

11e Create objectionable odors in substantial concentrations, affecting a substantial number of people, which could result in injury, nuisance or annoyance to a considerable number of persons or would endanger the comfort, health or safety of the public.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential conflicts with the air quality management plan (11a); pollutant emissions and potential violation of an air quality standard (11b, 11c); exposure of sensitive receptors to substantial pollutant concentrations (11d); and creation of objectionable odors (11e).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030. The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents as discussed in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR. The buildout projections estimate 3,140,000 additional square feet of commercial, office and industrial uses by the year 2030.

Impact 4.11-1 Consistency with AQMP
Adoption and implementation of the General Plan 2030 could indirectly result in increased population associated with potential development that would be accommodated by the Plan. The increased population would exceed population estimates in the Air Quality Management Plan in 2030, and thus the project would be inconsistent and conflict with the AQMP. This is considered a *potentially significant impact*.

Adoption and implementation of the proposed *General Plan 2030* would not obstruct implementation of the region's "Air Quality Management Plan" (AQMP) as the AQMP is independently developed and implemented by the MBUAPCD. However, the State CEQA Guidelines §15125(d) requires that an EIR discuss consistency between a proposed project and applicable regional plans, including the AQMP. The MBUAPCD's "CEQA Guidelines" consider inconsistency with the AQMP to be a significant cumulative adverse air quality impact.

The AQMP is prepared to address attainment of the State ozone AAQS and maintenance of the federal ozone AAQS. The plan accommodates growth by projecting growth in emissions based on different indicators. For example, population forecasts adopted by AMBAG are used to forecast population-related emissions. Through the planning process, emissions growth is offset by basinwide controls on stationary, area, and transportation sources of air pollution (Monterey Bay Unified Air Pollution Control District, February 2008). Thus, population-related emissions have been forecast in the AQMP using population forecasts adopted by AMBAG, and population-changing projects which are consistent with these forecasts are consistent with the AQMP. Projects which are not consistent with the AQMP's population projections have not been accommodated in the AQMP and would have a significant cumulative impact on regional air

quality unless emissions are totally offset (Monterey Bay Unified Air Pollution Control District, February 2008).

Consistency of indirect emissions associated with a commercial, industrial or institutional projects intended to meet the needs of the population as forecast in the AQMP is determined by comparing the estimated current population of the county in which the project is to be located with the applicable population forecast in the AQMP. If the estimated current population does not exceed the forecasts, indirect emissions associated with the project are deemed to be consistent with the AQMP (Monterey Bay Unified Air Pollution Control District, February 2008).

As indicated above, the proposed *General Plan 2030* would not directly result in increased population. However, the draft General Plan includes policies and a land use map that support additional development. Based on estimates provided by the City's land use consultant as described in the LAND USE (Chapter 4.1) section of this EIR and summarized above, potential residential development that could be accommodated in the draft *General Plan 2030* could result in a population increase of approximately 8,040 residents between 2009 and 2030.[1] This would result in a total city population of 67,022 in the year 2030 over 58,982 residents in 1990. This population is slightly higher (about 1,140 residents) than the AMBAG forecast of 65,884 residents in the year 2030, but is less than AMBAG's projection of 67,807 residents in the City in 2035.

Estimated population growth indirectly resulting from the proposed *General Plan 2030* represents an average annual growth rate of 0.65%, which is slightly lower than historical growth rates experienced in the City since 1990 (0.9%), but similar to the AMBAG forecast growth rate forecast between 2010 and 2030 (0.56%) as discussed further in the POPULATION & HOUSING (Chapter 4.2) section of this EIR. The increase over AMBAG projected levels (approximately 55 additional persons per year averaged over the 20-year General Plan horizon) is not considered substantial. Nonetheless, at some point after 2020 or 2025, the City's population may exceed population projections developed by AMBAG and included in the AQMP.

AMBAG population projections and the MBUAPCD's emissions forecasts and AQMP are updated regularly to account for changes in population and air quality trends. Since potential inconsistencies with the AQMP's population projections would not occur for at least 10 years, there is an opportunity for subsequent updates to reflect the City's anticipated population associated with potential buildout of the *General Plan 2030*. The City has requested that the regional forecasts be updated to reflect growth envisioned in the draft General Plan, and the MBUAPCD has concurred with this approach.

During the preparation of this Draft EIR, the MBUAPCD approved a new consistency procedure in June 2011. The new procedure, which is effective September 1, 2011. uses AMBAG's adopted housing unit forecast instead of the population forecast, and the MBUAPCD has developed a spreadsheet to assist jurisdictions with developing calculations (Monterey Bay Unified Air Pollution Control District, July 2011).The AMBAG forecasts show an increase of 2,413 dwelling units between 2009 and 2030 as discussed in Chapter 4.2 of this EIR, whereas

[1] Based on an average household size of 2.4 people, as discussed in the POPULATION & HOUSING (Chapter 4.2) section of this EIR.

the projected buildout from the proposed *General Plan 2030* would result in development of 3,350 housing units. Under the new procedure, the proposed project would also be inconsistent with the AQMP, although the increase in housing units under the proposed plan represents an average annual growth rate of approximately 0.7%, which is less than the historic average annual rate of about 1.1% experienced between 1990 and 2009.

The proposed *General Plan 2030* also includes a number of policies and actions that serve to reduce vehicle emissions (30% by 2020 per NRC4.1.3), support alternative transportation, and support sustainable land use patterns, all of which would help contribute to a reduction in vehicle emissions. Table 4.11-3 summarizes policies that directly or indirectly avoid or reduce air pollutant emissions and impacts.

Conclusion. The estimated General Plan buildout could result in indirect population and housing unit increases that exceed current AMBAG forecasts used in the Monterey Bay Unified Air Pollution Control District's *Air Quality Management Plan*. Therefore, according to MBUAPCD's CEQA Guidelines, this inconsistency between growth forecasts of the proposed *General Plan 2030* and the current AQMP would be considered a significant impact. However, the population growth and housing unit increase exceedance would not occur for at least 10+ years, if it occurs at all, and the potential population accommodated under the *General Plan 2030* represents a growth rate of approximately 0.6% (approximately 55 additional persons per year), which is slightly less than the historical rate experienced in the City since 1990, but similar to the rate in AMBAG's current population forecast (0.56%). Similarly, the potential housing units accommodated under the *General Plan 2030* represents a growth rate of approximately 0.7% (approximately 45 additional residential units per year), which is slightly less than the historical rate experienced in the City since 1990 (1.1%). MBUAPCD has future updates to regional forecasts, and updates of the AQMP can be made to incorporate updated City population and housing unit projections. Furthermore, the *General Plan 2030* includes several policies and actions that, when implemented, would reduce vehicle miles traveled and thus, air pollutant emissions from vehicle trips, which is consistent with the goals of the MBUAPCD's AQMP.

Mitigation Measures

Implementation of the following mitigation measure will reduce the impact to a less-than-significant level.

MITIGATION 4.11-1 The City shall work with the MBUAPCD and AMBAG and request that AMBAG's next population and housing forecast for the city of Santa Cruz and MBUAPCD's next *Air Quality Management Plan* be updated to reflect potential growth that could be accommodated by the General Plan 2030.

TABLE 4.11-3
Proposed General Plan Policies & Actions that Reduce Air Emissions & Air Quality Impacts

Type of Measure / Action	Policies / Actions
MEET AIR QUALITY STANDARDS and DEVELOPMENT REVIEW & MITIGATION	• Strive to exceed air quality standards: HZ2.1 • Address air quality issues: HZ2.2 • Ensure development does not create air pollution through project-level environmental review process: LU 1.2, LU1.2.1 • Require project-development mitigation: HZ2.2.1, HZ2.2.2 • Encourage green, sustainable industries and businesses that don't pollute: ED6.2, ED6.2.1, ED6.2.2 • Recycle/eliminate Chlorofluorocarbons (HZ2.1.3) & strive to eliminate polystyrene foam (HZ2.1.4) • Implement Smoking Pollution Control Ordinance: HZ2.2.5
REDUCE AUTO / VEHICLE TRIPS & EMISSIONS	• Vehicle emissions reduced 30% by 2020: NRC4.1.3 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 • Encourage employment-related strategies (i.e., flex-time, telecommuting, parking management, ridesharing): M3.1.7, M3.1.8, M.2.1.9 • Encourage public education programs to reduce transportation-related emissions and pollutants: HZ2.2.4
PROTECT SENSITIVE RECEPTORS	• Locate sensitive receptors from major air pollution sources or require mitigation: HZ2.2.3
SUPPORT ALTERNATIVE TRANSPORTATION MODES TO REDUCE EMISSIONS	• Plan and support alternative transportation options, modes and strategies: NRC4.4.2. • Encourage use of alternative transportation modes: M.2.1.2 • See TABLE 4.4-4 IN THE TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list
SUPPORT LAND USE PATTERNS TO REDUCE VEHICLE TRIPS & EMISSIONS	• Reduce auto use with pedestrian/transit-oriented activity centers & development centers (M1.1), Expand neighborhood facilities (LU4.3, LU4.3.1), and Encourage land use changes that reduce auto use: LU4.2) • Encourage home occupations & telecommuting: LU4.4, LU4.4.1 and Live-work units: LU4.1.4, HA4.4 (artists) • Ensure optimum utilization of infill parcels (LU1.1, LU1.1.1) and Consolidation of Parcels (LU1.1.2) • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU3.10 & LU3.10.1 (commercial uses allowed in all districts), LU4.1.1, LU4.2.2 (new districts) & Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 • See TABLE 4.4-4 IN THE TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list

Impact 4.11-2 Increased Emissions of Criteria Pollutants
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in emissions of criteria pollutants due to new development that would be accommodated by the Plan within an air basin that currently exceeds state standards for ozone and PM_{10}. However, emissions of criteria pollutants are expected to decrease in the future, and new emissions would not contribute to potential air quality violations. Additionally, with implementation of proposed *General Plan 2030* policies and actions and adherence to regional guidelines for future project-level reviews, indirect emissions resulting from buildout under the Plan would not be expected to substantially increase ozone precursors and particulate matter or result in air quality violations. This is considered a *less-than-significant impact*.

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized in subsection 4.11.2 above, could result in mobile sources of emissions associated with vehicle trips, as well as project-level construction-related emissions, as discussed below. The proposed General Plan does not identify or support any major new potential stationary emission sources.

Future Project-Level Stationary Emissions

Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment. The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Depending on the specific use, some industrial uses can result in a stationary source of emissions. However, Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. Additionally, Policy ED6.2 encourages and supports "green" and environmentally-oriented businesses to locate in Santa Cruz. Furthermore, the draft plan supports "green" and sustainable commercial and industrial operating practices (ED6.2.2) and encourages businesses that "don't pollute" (ED6.2.3). Overall, the types of industries and businesses supported in the draft *General Plan 2030* are not significant sources of stationary emissions.

The draft plan supports specific land uses, such as directing large regional retail uses to the Harvey West area (LU3.2.8), encouraging a performing arts center downtown (HA2.2.5), attracting a "top-end" hotel (ED1.5.2), and encouraging development of neighborhood facilities, such as parks, schools daycare centers and neighborhood commercial services. None of these types of uses would be expected to result in significant stationary sources of emissions.

The draft plan does support development of a desalination plant (LU3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (IWP) (see the WATER

SUPPLY [Chapter 4.5] section of this EIR for further discussion of the planned desalination facility). A program EIR prepared for the IWP also reviewed potential impacts of a desalination facility, but did not identify stationary sources as a potentially significant air quality impact (EDAW, June 2005). This type of facility is not expected to be a source of stationary emissions, except for potential intermittent use of back-up generators in the event of a power outage. (See the WATER SUPPLY (Chapter 4.4) of this EIR for further discussion of potential impacts related to construction and operation of a desalination facility.)

The MBUAPCD regulates stationary emissions through its Rule 200. This rule applies to "any person who builds, erects, alters, or replaces any article, machine, equipment or other contrivance which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants."

Future Project-Level Operational Emissions

The primary operational emissions associated with the proposed project are ozone precursors, particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO) and carbon dioxide (CO2), primarily emitted as vehicle exhaust for ozone precursors and CO. New development accommodated by the general plan could affect air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds ambient air quality standards.

As indicated above, the primary sources of the ozone precursor, VOC within the planning area, are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. Major sources of primary particles include fugitive dust from roads and agricultural operations. Secondary particulates are formed in the atmosphere largely by chemical reactions involving gases, e.g., sulfate from directly emitted sulfur oxides. Construction-related activities associated with future development projects would be the primary source of PM_{10} emissions.

Mobile source emissions would be associated with new vehicle trips. The estimated *General Plan 2030* buildout could result in an increase of 78,236 new average daily trips (ADT). However, vehicular emission rates are anticipated to lessen in future years due to continuing improvements in automobile and fuel efficiency programs implemented by the state of California (Monterey Bay Unified Air Pollution Control District, August 2008). Additionally, as previously indicated, the MBUAPCD's existing AQMP forecasts a substantial reduction in emissions over the next 20-year period.

Emissions were modeled as part of the preparation of this EIR. The URBEMIS model was run for part of the calculation of greenhouse gas emissions (carbon dioxide), and the results also include criteria pollutant emissions. The model was run for the project for both the baseline year and buildout year. The results show a substantial decrease in emissions, which supports the Air District's conclusion of expected reductions in emissions in the future.

The EMFAC 2007 program was used to generate emissions factors for Santa Cruz for vehicular emissions. The methodology involved developing estimates of Vehicle Miles Travelled (VMT) within city limits and multiplying by an annual average emission factor derived from the EMFAC-2007 program. The results are shown in Table 4.11-4. Ozone precursors (ROG and NO_x) and CO show substantial reductions by 2030 despite anticipated increases in VMT due to

reductions in per-mile emission rates for the 2030 vehicle fleet. (See summary in Appendix E for further details.) This decrease would have the effect of offsetting indirect emissions generated as a result of development accommodated by the proposed *General Plan 2030*. Thus, the project would not result in emission levels that would potentially contribute to air quality violations for ozone precursors.

TABLE 4.11-4
Criteria Pollutant Emissions

Year	Daily Average Emissions in Pounds/Day			
	ROG	CO	NO_x	PM_{10}
Citywide Emissions - 2008	328.6	6,854.1	1,194.6	40.0
Citywide Emissions - 2030	82.8	1,997.6	332.93	45.8
Change	-245.8	-4,856.5	-861.7	+5.8

Source: Donald Ballanti, August 2011

Future emissions, however, would result in a net increase in PM_{10} emissions with a potential to contribute to future air quality violations. However, the MBUAPCD's CEQA Guidelines include significance criteria for development projects so that daily thresholds are not exceeded. Future review and compliance with these standards (as discussed further below) would ensure that thresholds for PM_{10} are not exceeded.

Increased traffic also would result in a reduction of intersection levels of service (LOS) to unacceptable levels (below D) at 11 intersections or a significant worsening at 10 intersections currently operating at unacceptable levels of service if no improvements are made (as discussed in the TRANSPORTATION & TRAFFIC [Chapter 4.4] section of this EIR). This would contribute to localized carbon monoxide emissions. However, intersection improvements identified in the City's Traffic Impact Fee Program or identified in this EIR (see Chapter 4.4) would improve LOS to acceptable levels at 10 of these intersections and improve LOS or delays at most of the remaining intersections. Furthermore, proposed General Plan policies seek to maintain an acceptable LOS D or better at signalized intersections with acceptance of a reduced LOS at major regional intersections (M3.1.3, M3.1.4) and promotion of transportation system management strategies (M2.5.2) and other alternative transportation modes as summarized in Table4.4-4 in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR. Discussions with MBUAPCD staff indicate that high concentrations of localized CO emissions ("hot spots") are generally not a problem in the region, and future developments would need to address the potential for exposure of sensitive receptors to CO hot spots at the project level during environmental review (Getchell and Nunes, personal communication, February 2011).

Future Project-Level Construction-Related Emissions

Future development supported and/or accommodated by the proposed General Plan would result in construction-related emissions that could affect air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds California

ambient air quality standards for these pollutants. Construction activities include demolition, excavation, grading, vehicle trips (including workers, deliveries and hauling), and vehicle travel on paved and unpaved surfaces. Vehicle and equipment exhaust would generate pollutant emissions. Construction projects may also generate diesel particulate emissions from diesel-fueled equipment.

Particulate matter is the pollutant of greatest concern that is emitted from construction, particularly during site preparation and grading. Particulate matter emissions can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, type of equipment in operation, and weather conditions. Off-road construction equipment is also a large source of NO_X and diesel particulate matter, a state-designated toxic air contaminant (TAC). The scale and timing of construction is unknown, and construction activities would be variable throughout the day and overall construction period.

Proposed General Plan Policies & Future Project Reviews

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on air quality. These include: environmental review of future proposed development to address project-level emissions and air quality impacts resulting from development projects proposed in the future in accordance with the General Plan (LU1.2, LU1.2.1); requiring project-level mitigation measures (HZ2.2.1, HZ2.2.2); and actions to reduce vehicle trips and associated emissions (M1.1, M3.1, M3.1.1, M3.1.2, NRC4.1.3). Other goals, policies and actions promote sustainable land use patterns, such as encouraging mixed-use development along the City's four major transportation corridors that have easy access to pedestrian, bike and transit facilities, and encouraging use of alternative transportation modes. The proposed *General Plan 2030* also seeks to reduce vehicle emissions (30% by 2020 per NRC4.1.3), and includes a number of policies that seek to reduce single passenger vehicle trips, which would also reduce greenhouse gas emissions and other air pollutant emissions from vehicles (see Table 4.12-5 in the GLOBAL CLIMATE CHANGE [Chapter 4.12] section of this EIR). Table 4.11-3 summarizes policies that directly or indirectly address air quality issues or emissions.

As indicated in the MBUAPCD's response to the EIR "Notice of Preparation", future development projects constructed in accordance with the proposed *General Plan 2030* could have impacts on air quality, which would be evaluated when the projects are proposed. Projects with emissions below the District's significance threshold would not be considered to result in significant impacts. Under the District's current CEQA Guidelines, a project would result in a significant impact if the project would result in generation of emissions of or in excess of the following emissions levels:

- 137 pounds per day for VOC or NO_x, 550 pounds per day of carbon monoxide,
- 150 pounds per day of sulfur oxides (SO_x) for new operational sources, and/or
- 82 pounds per day of PM_{10} due to construction with minimal earthmoving on 8.1 or more acres per day or grading/excavation site on 2.2 or more acres per day for PM_{10}.

As indicated above, the proposed General Plan does include a policy and action requiring evaluation of air quality impacts as part of specific development proposals and implementation of project-level mitigation measures if required. Future projects proposed in accordance with provisions of the Draft *General Plan 2030* would be required to utilize the project-level significance thresholds for operations included in the MBUAPCD's "CEQA Guidelines," which would be considered during the environmental review process for future projects. The MBUAPCD's "CEQA Guidelines" also specify types of mitigation measures for operational and construction-related emissions. Projects will be required to implement control measures to ensure that emissions and construction-related PM_{10} emissions do not exceed MBUAPCD's daily thresholds. Additionally, land uses with stationary sources of emissions would be subject to review and approval by the MBUAPCD.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result primarily in mobile and construction-related emissions, and limited potential stationary sources of emissions. Future emissions of ozone precursor pollutants are projected to decrease, and thus, project-level emissions would not contribute to existing or potential future violations of ozone precursors or CO air quality standards. While, PM_{10} emissions would increase, compliance with MBUAPCD significance criteria at a project level would ensure that project emissions do not exceed daily standards. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in automobile and fuel efficiency and new regulations and programs adopted by the state of California that are scheduled to be phased in over the life of the proposed General Plan, and such reductions are factored into the air quality models used to estimate emissions. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on air quality, including environmental review to address project-level emissions, requiring project-level mitigation measures, and reduction of vehicle trips and emissions as summarized on Table 4.11-3. With implementation of these proposed policies and actions, as well as future project-level environmental review and compliance with MBUAPCD requirements and air quality control measures and adherence to permit requirements of the MBUAPCD, the proposed *General Plan 2030*'s indirect contribution to air emissions and air quality impacts would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* actions are recommended to strengthen support for MBUAPCD air pollution control strategies.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

HZ2.2.1 ~~Incorporate~~ Require future development projects to implement applicable Monterey Bay Unified Air Pollution Control District control measures and/or air quality

mitigations in the design of new projects as set forth in the District's "CEQA Guidelines".

HZ2.2.2 Permit major indirect sources of air pollution only if they provide transportation measures to reduce their impacts to ~~an in~~ a less-than-significant level, consistent with applicable MBUAPCD recommended mitigation and control measures as set forth in the District's "CEQA Guidelines".

HZ2.2.6 Support MBUAPCD air pollution control strategies, air quality monitoring and enforcement activities.

Impact 4.11-3 Exposure of Sensitive Receptors to Pollutants
The increased population or development accommodated by the proposed *General Plan 2030* could indirectly result in exposure of existing or new sensitive receptors to pollutant concentrations which would not be considered substantial with implementation of the proposed *General Plan 2030* policies and actions and the regulation of stationary sources by the Monterey Bay Unified Air Pollution Control District. This is considered a *less-than-significant impact*.

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development that is consistent with the Plan. This potential development, as summarized in subsection 4.11.2 above, would primarily result in mobile sources of emissions associated with vehicle trips, as well as project-level construction-related emissions, as discussed under Impact 4.11-2 above. The proposed General Plan does not identify or support any major new potential stationary emission sources. The proposed plan does include continued industrial land use designations, but as discussed above under the Impact 4.11-2 discussion, the types of new businesses and industry supported in the draft *General Plan 2030* are not likely to be significant sources of stationary emissions.

Sensitive receptors within the proposed General Plan planning area include residential uses, schools, libraries and senior centers. Sensitive receptors could be potentially subject to stationary and/or vehicular emissions and pollutants such as toxic air contaminants from stationary sources, carbon monoxide (CO) emissions from vehicular traffic, and/or diesel emissions from construction-related emissions.

The proposed *General Plan 2030* requires that air pollution-sensitive land uses be located away from major sources of air pollution or require mitigation measures to protect residential and sensitive land uses from freeways, arterials, point source polluters, and hazardous material locations (HZ2.2.3). Additionally, any potential source of stationary emissions would be subject to MBUAPCD review and approval to ensure emissions do not create or substantially contribute to air quality violations. Stationary sources with potential toxic air contaminants would also be

subject to MBUAPCD review and approval to ensure that there are no significant impacts to adjacent residents, sensitive receptors and/or other land uses.

Vehicle emissions can result in concentrations of carbon monoxide at impacted intersections due to congestion and vehicle idling. The MBUAPCD thresholds for CO emissions require projects to perform localized CO modeling for intersections that operate with deficient levels of service. As discussed above under Impact 4.11-2, increased traffic would result in a reduction of intersection levels of service (LOS) to unacceptable levels (below D) at 11 intersections or a significant worsening at 10 intersections currently operating at unacceptable levels of service. This would contribute to localized carbon monoxide emissions. However, intersection improvements identified in the City's Traffic Impact Fee Program or identified in this EIR (see Chapter 4.4) would improve LOS to acceptable levels at 10 of these intersections and improve LOS or delays at most of the remaining intersections. Furthermore, proposed General Plan policies seek to maintain an acceptable LOS D or better at signalized intersections with acceptance of a lower LOS at major regional intersections (M3.1.3, M3.1.4) and promotion of transportation system management strategies (M2.5.2) and other alternative transportation modes as summarized in Table 4.4-4 in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR. Discussions with MBUAPCD staff indicate that high concentrations of localized CO emissions are generally not a problem in the region, and future developments would need to address CO emissions at the project level during environmental review (Getchell and Nunes, personal communication, February 2011).

Diesel particulate matter was identified as a toxic air contaminant (TAC) by the State of California in 1998. Following the identification of diesel as a TAC, the California Air Resources Board (CARB) developed a comprehensive strategy to control diesel PM emissions. The "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles"—a document approved by ARB in September 2000—set goals to reduce diesel PM emissions in California by 75% by 2010 and 85% by 2020. This objective would be achieved by a combination of approaches (including emission regulations for new diesel engines and low sulfur fuel program). An important part of the Diesel Risk Reduction Plan is a series of measures for various categories of in-use on- and off-road diesel engines, which are generally based on the following types of controls:

- Retrofitting engines with emission control systems, such as diesel particulate filters or oxidation catalysts,
- Replacement of existing engines with new technology diesel engines or natural gas engines, and
- Restrictions placed on the operation of existing equipment.

Once the Diesel Risk Reduction Plan was adopted, the ARB started developing emission regulations for a number of categories of in-use diesel vehicles and equipment. In July 2007, the ARB adopted regulations for in-use, off-road diesel vehicles that will significantly reduce particulate matter emissions by requiring fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits.

Demolition, excavation, grading and project construction could involve the use of diesel trucks and equipment that will emit diesel exhaust, including diesel particulate matter, which is

classified as a TAC. Adjacent residents and businesses would be exposed to construction-related diesel emissions, but activities that would use diesel equipment would be of temporary and of short-term duration. CARB has identified diesel exhaust particulate matter as a TAC, and assessment of TAC cancer risks is typically based upon a 70-year exposure period. Project excavation and construction activities that would utilize diesel-powered equipment would expose receptors to possible diesel exhaust for a very limited number of days out of a 70-year (365 day per year, 24-hour per day) period. Because exposure to diesel exhaust will be well below the 70-year exposure period, and given the limited and short-term duration of activities that would use diesel equipment, construction-related diesel emissions are not considered significant. Furthermore, the State is implementing emission standards for different classes of on- and off-road diesel vehicles and equipment that apply to off-road diesel fleets and includes measures such as retrofits. Additionally, Title 13 of the California Code of Regulations (section 2485(c)(1)) prohibit idling of a diesel engine for more than 5 minutes in any location.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could result in stationary, operational and/or construction-related emissions near sensitive receptors. However, with implementation of proposed General Plan policies to locate sensitive receptors away from major sources of air pollution, to reduce traffic (and thus traffic-related emissions), and to conduct project-specific environmental review when new development is proposed in the future, would avoid exposure of sensitive receptors to substantial pollutant concentrations. With implementation of these proposed policies and actions, as well as future project-level environmental review and compliance with MBUAPCD requirements and air quality control measures and adherence to permit requirements of the MBUPCD, the proposed General Plan 2030's indirect contribution to air emissions and air quality impacts would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.11-4 Odors
Adoption and implementation of the *General Plan 2030* would not directly or indirectly result in new uses that would be result in introduction of substantial odors with implementation of proposed policies and actions and adherence to City regulations. Thus, *no impacts* are expected related to odors.

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development. According to the MBUAPCD, objectionable odors include sulfur compounds and methane, and typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries (Monterey Bay Unified Air Pollution Control District, February 2008).

The proposed *General Plan 2030* does not specifically identify, designate or support any new stationary sources that would be considered likely significant odor-generating facilities. The proposed 5.5-acre addition to the landfill is not proposed for expansion of the landfill disposal operations. As previously indicated, the City of Santa Cruz Municipal Code Section 24.14.264 prohibits emission of odorous gases or matter in quantities readily detectable. Additionally, future proposed development will be subject to project-level environmental review (LU1.2, LU1.2.1) and mitigation (HZ2.2.1), if required, which would result in avoidance of potentially significant impacts related to odor.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development. New development accommodated by the plan would not be expected to result in generation of significant odors with implementation of proposed General Plan policies to ensure that new development does not result in unacceptable air pollution (including project-specific environmental review and mitigation) and with compliance with City regulations that prohibit odor emissions.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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