# 3.3 AIR QUALITY

This section is based on the Monterey Bay Unified Air Pollution Control District's CEQA Air Quality Guidelines (June 2004) and the current Air Quality Management Plan. It includes a summary of regional air quality conditions, and an analysis of potential air quality impacts associated with the implementation of the three plans.

## 3.3.1 SETTING

### Meteorology

Air quality is affected by the rate and location of pollutant emissions and by climatic conditions that influence the movement and dispersion of pollutants. Atmospheric conditions such as wind speed, wind direction and air temperature gradients, along with local and regional topography, provide the links between air pollutant emissions and air quality.

The three counties that are covered by the 2005 MTP (Monterey, San Benito and Santa Cruz) comprise the North Central Coast Air Basin (NCCAB). The basin covers an area of 5,159 square miles along the central coast of California. The Santa Cruz Mountains dominate the northwest sector of the basin, while the Diablo Range marks the northeastern boundary, with the Santa Clara Valley between them. This valley transitions into the San Benito Valley, which runs northwest-southeast and is bounded on the west by the Gabilan Range. West of the Gabilan Range is the Salinas Valley, extending from Salinas in the northwest to King City in the southeast. The western edge of the Salinas Valley is formed by the Sierra de Salinas, which is also the eastern edge of the smaller Carmel Valley. The Santa Lucia Range along the Pacific coast defines the western edge of the Carmel Valley.

The basic controlling factor in the climate of the North Central Coast Air Basin is the semi-permanent high pressure cell in the eastern Pacific. During the summer, this cell is dominant, causing persistent west and northwest winds over the California coast. Air descending in the Pacific High forms a stable temperature inversion (a layer of hot air over a cool layer of coastal air). As onshore air currents pass over cool ocean waters, fog and relatively cool air moves into the coastal valleys, while warmer air aloft acts as a lid to inhibit vertical air movement.

The general orientation of mountain ridges (northwest-southeast) tends to restrict and channel summer onshore air currents. In the interior portions of the Salinas Valley and San Benito Valley, surface heating creates a weak low pressure which intensifies onshore air flow during the afternoon and evening.

In the fall, when surface winds become weak, the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement. The relatively stationary air mass is held in pace 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, which can transport pollutants from either the San Francisco Bay area or the Central Valley into the North Central Coast Air Basin.

In the winter, the Pacific High migrates further south, and has less influence on the North Central Coast Air Basin. Air frequently flows in a southeasterly direction out of the Salinas Valley and the San Benito Valley, especially during night and early morning hours. Although northwest winds remain dominant in winter, easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems passing through the basin usually result in good air quality in winter and early spring.

Coastal mountains in Santa Cruz County exert strong influence on atmospheric circulation, and result in generally good air quality. Small inland valleys with low mountains on two sides (i.e., Scotts Valley) have poorer circulation than do areas on the coastal plain (i.e., Santa Cruz). Scotts Valley is downwind of major pollutant generating centers, and these pollutants have time to form oxidant while moving toward the area. This is why air pollutants tend to be more likely to build up in Scotts Valley than at Santa Cruz.

Monterey Bay represents a 25-mile wide inlet that allows marine air at low levels to penetrate interior areas. The Salinas Valley is a steep-sloped coastal valley opening out onto Monterey Bay and extending southeastward between mountain ranges with elevations ranging as high as two to three thousand feet. Near its mouth, the valley floor is approximately 25 miles wide, but its width narrows to about six miles at Soledad (40 miles inland) and to three miles at King City (approximately 60 miles from the coast). At Salinas (near the northern end of the valley), west and northwest winds occur about half the time during the entire year. While the summer coastal stratus rarely extends beyond Soledad, the extended sea breeze consisting of warmer and drier air frequently reaches far down the Salinas Valley. At the southern end of the Salinas Valley (extending beyond the North Central Coast Air Basin to Paso Robles), winds are generally weaker most of the year, except during storm periods.

At the northern end of the San Benito Valley, Hollister experiences westerly winds nearly one-third of the time. During the summer months, the prevailing air flow probably originates in the Monterey Bay area and enters the northern end of the San Benito Valley via the air gap through the Gabilan Range formed by the Pajaro River. In addition, a northwesterly air flow frequently moves pollutants from the Santa Clara Valley into the San Benito Valley.

**Pollutants**

Primary criteria pollutants are emitted directly from a source (i.e., an automobile, an exhaust stack of a factory, etc.) into the atmosphere. At the federal level, National Ambient Air Quality Standards (AAQS) have been established for carbon monoxide (CO - produced chiefly by internal combustion engines), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), ozone ($O_3$), inhalable particulate matter ($PM_{10}$), fine particulate matter ($PM_{2.5}$), and lead (Pb). The State of California has adopted AAQS

which address the national criteria pollutants, and generally set more stringent limits. The California AAQS also establish standards for sulfates, hydrogen sulfide, vinyl chloride and visibility. **Table 3-1** summarizes federal and State AAQS.

The three criteria pollutants of concern within the NCCAB are ozone, PM10 and carbon monoxide. A description of each of these pollutants, their sources and their effects on human health and welfare, as presented in the MBUAPCD CEQA Air Quality Guidelines pages 3-2 and 3-3 (June 2004) is provided below, along with a brief discussion of Toxic Air Contaminants focused on diesel particulate matter.

### *Ozone ($O_3$)*

Ozone in the lower atmosphere is one of the main components of smog. It 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 (VOC) are considered to be the primary compounds, or precursors, contributing to the formation of ozone. Ozone is viewed as both a secondary pollutant and as a regional pollutant.

Short-term exposure to ozone, a strongly oxidizing species, results in injury and damage to the lungs, decreases in pulmonary function, and impairment of immune mechanisms. These changes have been implicated in the development of chronic lung disease as a result of longer-term exposure. Symptoms of ozone irritation include shortness of breath, chest pain when inhaling deeply, wheezing and coughing. Children and persons with pre-existing respiratory disease (e.g., asthma, chronic bronchitis, emphysema) are at greater risk. In addition, effects on vegetation have been documented at concentrations below the standards.

In 2003, daily emissions of VOC and $NO_x$ in the NCCAB were estimated at 78 tons and 88 tons, respectively, with on-road mobile sources making up 28 percent of total VOC emissions and 50 percent of total $NO_x$ emissions.

### *Inhalable Particulates ($PM_{10}$)*

Inhalable particulates refer to particulate matter less than 10 microns in diameter ($PM_{10}$). Particulates are classified as primary or secondary, depending on their origin. Primary particulates are unchanged after being directly emitted (e.g., road dust), and are the most commonly analyzed and modeled for 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. In 1997, the U.S. Environmental Protection Agency (EPA) adopted a fine particulate matter standard of 2.5 microns or less in diameter ($PM_{2.5}$). The California Air Resources Board (ARB) adopted an annual $PM_{2.5}$ standard in 2002.

Recent studies undertaken by EPA identify key health effects associated with particulate matter, including:

**TABLE 3-1: AMBIENT AIR QUALITY STANDARDS**

| Pollutant | Averaging Time | California Standard[b] | | National Standards[c] | | | |
|---|---|---|---|---|---|---|---|
| | | ppm | µg/m³ | Primary[d] | | Secondary[e] | |
| | | | | ppm | µg/m³ | ppm | µg/m³ |
| Ozone | 1 hour | 0.09 | 180 | 0.12 | 235 | 0.12 | 235 |
| | 8 hour | | | 0.08 | | 0.08 | |
| Carbon Monoxide | 8 hours | 9.0 | 10,000 | 9.0 | 10,000 | 9.0 | 10,000 |
| | 1 hour | 20.0 | 23,000 | 35.0 | 40,000 | 35.0 | 40,000 |
| Nitrogen Dioxide | Annual | | | 0.053 | 100 | 0.053 | 100 |
| | 1 hour | 0.25 | 470 | | | | |
| Sulfur Dioxide[f] | Annual | | | 0.03 | 80 | | |
| | 24 hours | 0.04 | 105 | 0.14 | 365 | | |
| | 3 hours | | | | | 0.5 | 1,300 |
| | 1 hour | 0.25 | 655 | | | | |
| $PM_{10}$[g] | Annual | | 20 | | 50 | | 50 |
| | 24 hours | | 50 | | 150 | | 150 |
| $PM_{2.5}$[g] | Annual | | 12 | | 15 | | 15 |
| | 24 hours | | | | 65 | | 65 |
| Lead[g] | Calendar quarter | | | | 1.5 | | 1.5 |
| | 30-day avg | | 1.5 | | | | |
| Sulfate[g] | 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 is <70% w/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 particulate 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] Federal standards firs promulgated in µg/m³.
[g] Standards promulgated in µg/m³ only.

Source: Monterey Bay Unified Air Pollution Control District, CEQA Air Quality Guidelines, page 3-2, Table 3-1, June 2004.

- Premature mortality;
- Aggravation of respiratory and cardiovascular disease, as indicated by increased hospital admissions, emergency room visits, school absences, work loss days and restricted activity;
- Changes in lung function and increased respiratory symptoms;
- Changes in lung tissue and structure; and
- Altered respiratory defense mechanisms.

According to EPA, the recent epidemiological information indicates that several subpopulations are apparently more sensitive to effects of community air pollution containing particulate matter. Observed effects include decreases in pulmonary function reported in children and increased mortality reported in the elderly and individuals with cardiopulmonary disease.

In 2000, daily emissions of $PM_{10}$ within the NCCAB were estimated at 106 tons per day. Of this, entrained road dust represented 35 percent of all $PM_{10}$ emissions, windblown dust represented 20 percent, farming operations represented 15 percent, wasteburning represented 15 percent, construction represented 6 percent, and mobile sources, industrial processes and other sources represented 8 percent.

### *Carbon Monoxide (CO)*

Carbon monoxide is formed by the incomplete combustion of carbon-containing material. 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.

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 places angina patients, persons with other cardiovascular diseases or chronic ling obstructive disease, persons with anemia, and fetuses at risk. At higher levels, CO also affects the central nervous system. Symptoms of exposure may include headaches, dizziness, sleepiness, nausea, vomiting, confusion and disorientation.

Carbon monoxide emissions within the NCCAB were estimated at 487 tons per day in 2002, with motor vehicles contributing approximately 43 percent of total CO emissions. Electric utilities, fires, and other mobile and miscellaneous sources contributed to the remainder.

### *Toxic Air Contaminants (TACs)*

Toxic air contaminants (TACs) are pollutants which may be expected to result in an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. Health effects include cancer, birth defects, neurological damage, damage to the body's natural defense systems, and diseases which led to death.

TACs can be separated into carcinogens and noncarcinogens based on the nature of the physiological degradation associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts will not occur. Noncarcinogenic TACs differ in that there is generally assumed a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

In 1998, following a 10-year scientific assessment, the ARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. ARB staff intends to issue statewide guidance for diesel toxic impact analyses for various source categories, Until such time, MBUAPCD provides technical guidance for estimating potential diesel particulate material emissions from truck idling and movement (such as, but not limited to, truck stops, warehouse/distribution centers or transit centers) and train idling.

**Regulatory Framework**

### *United States*

In 1990, the federal Clean Air Act Amendments (CAAA) established a number of requirements, including new deadlines for attaining clean air standards and the development of State Implementation Plans (SIPs). The EPA administers the CAAA, and has established NAAQS for several air pollutants on the basis of human health and welfare criteria. To date, NAAQS have been established for CO, $O_3$, $SO_2$, $NO_2$, $PM_{10}$, $PM_{2.5}$ and Pb.

### *California*

Under the California Clean Air Act (CCAA), the California ARB is responsible for research activities, the establishment of California Ambient Air Quality Standards (CAAQS), guidelines for air quality management, and the regulation of both stationary and mobile emission sources. The CAAQS are generally more stringent than corresponding federal standards.

### *Monterey Bay Region*

The Monterey Bay Unified Air Pollution Control District (MBUAPCD) shares responsibility with the ARB for ensuring that State and national AAQS are achieved and maintained within the NCCAB. State law assigns local air districts the primary responsibility for control of air pollution

from stationary sources, while reserving to the ARB an oversight function. MBUAPCD is responsible for developing regulations governing emissions of air pollution, permitting and inspecting stationary sources of air pollution, monitoring of ambient air quality, and air quality planning activities, including implementation of transportation control measures (MBUAPD CEQA Air Quality Guidelines, page 2-2 [June 2004[).

As required under the CCAA, the MBUAPCD adopted the 1991 Air Quality Management Plan (AQMP) for the Monterey Bay region. The 1991 AQMP addressed attainment of CAAQS for ozone, and included measures to control emissions of VOC from stationary and mobile sources. Since the 1991 AQMP was adopted, control requirements have been reduced, and the 1991 AQMP was updated in 1994, 1997 and 2000 to reflect this change. The 2004 AQMP (adopted in September 2004) concluded that the NCCAB remains on the borderline between attainment and nonattainment for ozone, in part due to variable meteorological conditions occurring from year to year, transport of air pollution from the San Francisco Bay Area, and locally generated emissions. The photochemical model indicated that while the severity and extent of ozone exceedances are reduced in 2010 in comparison to 1990, some areas of the NCCAB may still not achieve the standard with current control measures.

**Current Air Quality**

Under the Federal Clean Air Act, the NCCAB is designated a maintenance area for the federal one-hour ozone AAQS (see **Table 3-2**). The NCCAB was redesignated from a moderate nonattainment area to a maintenance area in 1997 after meeting the federal one-hour standard in 1990.

Under the California Clean Air Act, the NCCAB is a moderate nonattainment area for the State ozone AAQS. The California Clean Air Act states that an ozone nonattainment area becomes nonattainment-transitional if the state AAQS is not exceeded more than three times at any monitoring station in the air basin. Further, the NCCAB is designated a nonattainment basin for the State $PM_{10}$ AAQS (see **Table 3-2**).

The MBUAPCD operates a network of ten ambient air quality monitoring stations throughout the NCCAB (at Salinas, Hollister, Carmel Valley, Santa Cruz, Monterey, Moss Landing, King City, Scotts Valley, Davenport and Watsonville). In addition, the National Park Service operates a monitoring station at the Pinnacles National Monument. .

Based on monitoring data from the ambient air quality monitoring stations, ozone concentrations exceeded State AAQS on 4 days on 2000, 3 days in 2001, 11 days in 2002, and 3 days in 2003. The majority of these violations occurred at the Pinnacles monitoring station, where the State AAQS was exceeded on 13 days between 1999 and 2003. Ozone concentrations exceeded the federal 8-hour ozone standard on 1 day in 2000, 2 days in 2001, 4 days in 2002, and 1 day in 2003. All of these exceedances occurred at the Pinnacles monitoring station. **Table 3-3** summarizes the exceedances of the State 1-hour and federal 8-hour ozone AAQS. There were no recorded violations of the federal $PM_{10}$ 24-hour AAQS at MBUAPCD monitoring stations from 1999 to 2002. There have been no

recorded violations of the federal or State carbon monoxide AAQS at MBUAPCD monitoring stations. However, based on air quality dispersion modeling, violations have been predicted at heavily congested intersections within the NCCAB.

**TABLE 3-2: ATTAINMENT STATUS OF THE NORTH CENTRAL COAST AIR BASIN**

| Pollutant | Federal | State |
|---|---|---|
| Ozone ($O^3$) – 1 hour | Maintenance | Moderate Nonattainment |
| Ozone ($O^3$) – 8 hour | Attainment | Not Applicable |
| Carbon Monoxide (CO) | Unclassified/Attainment | Monterey – Attainment<br>San Benito – Unclassified<br>Santa Cruz – Unclassified |
| Nitrogen Dioxide ($NO^2$) | Unclassified/Attainment | Attainment |
| Sulfur Dioxide ($SO^2$) | Unclassified | Attainment |
| Inhalable Particulates ($PM_{10}$) | Attainment | Non-Attainment |
| Inhalable Particulates ($PM_{2.5}$) | Unclassified | Not Applicable |

Source: Monterey Bay Unified Air Pollution Control District, CEQA Air Quality Guidelines, page 6-4, Table 6-1, June 2004.

**TABLE 3-3: EXCEEDANCES OF STATE 1-HOUR OZONE AND FEDERAL 8-HOUR OZONE AAQS IN NCCAB (1999-2003)**

| Year | Monitoring Station | Federal (Station Days) | State (Station Days) |
|---|---|---|---|
| 1999 | Pinnacles | 1 | 2 |
| | Santa Cruz | 0 | 1 |
| 2000 | Pinnacles | 0 | 2 |
| | Scotts Valley | 0 | 1 |
| | Monterey | 0 | 1 |
| 2001 | Pinnacles | 2 | 2 |
| | Hollister | 0 | 1 |
| 2002 | Pinnacles | 4 | 7 |
| | Hollister | 0 | 1 |
| 2003 | Pinnacles | 1 | 2 |
| | Scotts Valley | 0 | 1 |

Note: The data do not equal the number of separate days the State ozone AAQS was violated, as violations at two or more monitoring stations on the same day are considered to be one violation day.

Source: Monterey Bay Unified Air Pollution Control District, CEQA Air Quality Guidelines, page 6-7, Table 6-3, June 2004.

**Sensitive Receptors**

Sensitive receptors are population groups (children, the elderly, and sick persons) who may be located where there is a reasonable expectation of continuous human exposure according to the averaging period for the AAQS (e.g., 24-hour, 8-hour, 1-hour). These sensitive receptors are typically found in residences, hospitals and schools.

## 3.3.2 IMPACTS AND MITIGATION MEASURES

### THRESHOLDS OF SIGNIFICANCE

In accordance with CEQA Guidelines and the MBUAPCD CEQA Air Quality Guidelines, implementation of the three plans could create a significant impact if any transportation system improvement project identified in the financially constrained Action Elements would:

- Conflict with or obstruct implementation of the applicable air quality plan, or
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation, or
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors), or
- Expose sensitive receptors to substantial pollutant concentrations, or
- Create objectionable odors affecting a substantial number of people.

In addition, the MBUAPCD maintains quantitative thresholds of significance. Under MBUAPCD CEQA Air Quality Guidelines, a project will have a significant air quality effect on the environment if it would:

- Emit 82 pounds per day of $PM_{10}$ at the project site or result in a AAQS $PM_{10}$ exceedance at existing receptors during construction;
- Emit 137 pounds per day of VOC or $NO_x$ (from stationary sources and motor vehicle trips);
- Degrade the Level of Service (LOS) at an intersection/road segment from D or better to E or F, or increase the volume-to-capacity (V/C) ratio at an intersection/road segment at LOS E or F by 0.05 or more; or increase the delay at an intersection at LOS E or F by 10 seconds or more, or decrease reserve capacity at an unsignalized intersection at LOS E or F by 50 seconds or more;

- Emit 550 pounds per day of CO (from stationary sources);
- Emit 150 pounds per day of $SO_x$ (from stationary sources)
- Cause a violation of any other CAAQS or NAAQS;
- Be inconsistent with the AQMP; or
- Have any other significant adverse impacts (e.g., create objectionable odors, alter air movement, moisture, temperature or climate).

A project is deemed to be of statewide, regional, or areawide significance if it would interfere with the attainment or maintenance of CAAQS or NAAQS. The MBUAPCD CEQA Air Quality Guidelines state that emissions from a transportation project must be consistent with the emissions budget in the AQMP. Transportation projects are defined as roadways, roadway improvements and transit improvements. For a project to be consistent with the AQMP, the project emissions must have been accounted for in the emissions budget in the 2000 AQMP. If this is not the case, the project is considered inconsistent with the AQMP (unless project-related emissions are totally offset). This would represent a significant project-related and cumulative environmental impact, since it would impede attainment of the CAAQS for ozone within the NCCAB.

Long-term impacts to air quality associated with the implementation of the three plans will be considered significant if it results in mobile source emissions that exceed existing levels. In this case, the key pollutants of concern are ozone, CO and $PM_{10}$.

**Conformity with SIP/Consistency with AQMP**

Conformity with the federally-mandated regional air quality plan (part of the State Implementation Plan) is required of the 2005 MTP under the "conformity" requirements of the CAAA. Transportation Conformity addresses the federal ozone standards, and a conformity determination is made by comparing MTP travel data with assumptions used to generate the mobile source emission inventory for the federal air quality plan prepared by MBUAPCD. As the designated Metropolitan Planning Organization within the region, the Association of Monterey Bay Area Governments (AMBAG) is responsible for conformity findings for transportation plans.

Chapter VI of the 2005 Monterey Bay Area Metropolitan Transportation Plan contains a conformity analysis which indicates that implementation of the financially constrained Action Elements of the 2005 MTP, 2005 MCRTP and 2005 SCCRTP would result in the generation of air pollutants well below the established "budget" values for 2010, 2020 and 2030, and that the 2005 MTP, 2005 MCRTP and 2005 SCCRTP are, therefore, in conformity with the State Implementation Plan.

For the purposes of the conformity analysis, AMBAG has used the following values for estimated vehicle miles traveled (VMT) per day and vehicle trips per day in 2010, 2020 and 2030 in each of the three counties of the North Central Coast Air Basin (NCCAB):

| Year 2010 | VMT | Vehicle Trips |
|---|---|---|
| Monterey County | 12,245,000 | 2,082,000 |
| San Benito County | 2,027,000 | 352,000 |
| Santa Cruz County | 7,058,000 | 1 532,000 |
| **NCCAB Total** | **21,329,000** | **3,966,000** |

| Year 2020 | VMT | Vehicle Trips |
|---|---|---|
| Monterey County | 13,339,000 | 2,404,000 |
| San Benito County | 2,255000 | 449,000 |
| Santa Cruz County | 7,423,000 | 1,709,000 |
| **NCCAB Total** | **23,070,000** | **4,562,000** |

| Year 2030 | VMT | Vehicle Trips |
|---|---|---|
| Monterey County | 14,723,000 | 2,719,000 |
| San Benito County | 2,399,000 | 543,000 |
| Santa Cruz County | 7,764,000 | 1,880,000 |
| **NCCAB Total** | **24,886,000** | **5,140,000** |

In summary, the conformity analysis conducted by AMBAG has estimated the following emission levels relative to the established emission budgets for 2010, 2020 and 2030, in tons per day:

| Year 2010 | Reactive Organic Gases (ROG) | Nitrogen Oxides (NOx) |
|---|---|---|
| *Modeled Emissions* | | |
| Monterey County | 7.41 | 16.94 |
| San Benito County | 1.01 | 2.64 |
| Santa Cruz County | 5.32 | 8.39 |
| **Subtotal NCCAB** | **13.74** | **27.97** |
| Adjustment for Commuter Rail | -0.02 | less than 0.01 |
| **NCAAB Total** | **13.72** | **27.97** |
| *NCCAB Emissions Budget* | 39.09 | 43.14 |
| *Modeled Emissions as Percentage of NCCAB Emissions Budget* | 35.1% | 64.8% |

| Year 2020 | Reactive Organic Gases (ROG) | Nitrogen Oxides (NOx) |
|---|---|---|
| *Modeled Emissions* | | |
| Monterey County | 3.98 | 7.96 |
| San Benito County | 0.60 | 1.15 |
| Santa Cruz County | 2.84 | 3.69 |
| **Subtotal NCCAB** | **7.41** | **12.80** |
| Adjustment for Commuter Rail | -0.01 | less than 0.01 |
| **NCAAB Total** | **7.40** | **12.80** |
| *NCCAB Emissions Budget* | 39.09 | 43.14 |
| *Modeled Emissions as Percentage of NCCAB Emissions Budget* | 18.9% | 29.7% |

| Year 2030 | Reactive Organic Gases (ROG) | Nitrogen Oxides (NOx) |
|---|---|---|
| *Modeled Emissions* | | |
| Monterey County | 2.34 | 4.04 |
| San Benito County | 0.37 | 0.52 |
| Santa Cruz County | 1.62 | 1.92 |
| **Subtotal NCCAB** | **4.32** | **6.49** |
| Adjustment for Commuter Rail | -0.01 | less than 0.01 |
| **NCCAB Total** | **4.31** | **6.49** |
| *NCCAB Emissions Budget* | 39.09 | 43.14 |
| *Modeled Emissions as Percentage of NCCAB Emissions Budget* | 11.0% | 15.0% |

The MBUAPCD uses consistency with the AQMP to address a project's cumulative impact on regional air quality. Consistency addresses State ozone standards (which are more stringent than federal ozone standards), and the determination of consistency is made by comparing travel data in the three plans with the assumptions used to generate the mobile source emission inventory for State air quality plans prepared by MBUAPCD. The source of the 2000 AQMP growth assumptions was the 1997 AMBAG Regional Population Forecast, and there are inconsistencies between the travel demand model-generated vehicle miles of travel used in the three plans analyses and the 2000 AQMP travel activity data. The 2004 AQMP uses the same 2004 population projections for the period through 2030 as do the three plans. Therefore, the travel activity data used in the three plans analyses are consistent with the 2004 Air Quality Management Plan, adopted in September 2004.

**Short-Term Construction-Related Effects**

Construction activities associated with some of the projects identified in the financially constrained Action Elements of the three plans could result in temporarily increased levels of $PM_{10}$ downwind of construction sites. The MBUAPCD CEQA Air Quality Guidelines indicate that construction projects using typical construction equipment such as dump trucks, scrapers, bulldozers, compactors and front-end loaders which temporarily emit precursors of ozone (VOC and $NO_x$) are accounted for in the emissions inventories of AQMPs, and would not have a significant impact on the attainment or maintenance of CAAQS and NAAQS. However, the CEQA Air Quality Guidelines also indicate that the MBUAPCD should be consulted regarding emissions from non-typical equipment (e.g., grinders and portable equipment).

**IMPACT 3.3.1: Construction-Related Emissions.** Construction associated with most of the projects identified in the financially constrained Action Elements of the three plans could result in emissions from equipment, additional emissions from delayed vehicles and fugitive dust. Construction projects using typical construction equipment (e.g., dump trucks, scrapers, bulldozers, compactors and front-end loaders) which temporarily emit precursors of ozone (i.e., VOC and $NO_x$) are accommodated in the emission inventories of State- and federally-required air plans, and would not have a significant impact on the attainment and maintenance of ozone AAQS. Using the potential thresholds identified in the MBUAPCD CEQA Air Quality Guidelines (June 2004, page 5-3, Table 5-2), construction sites involving minimal earthmoving over an area of 8.1 acres or more

per day, or involving grading and excavation over an area of 2.2 acres or more per day would be expected to entail potentially significant effects associated with the generation of $PM_{10}$. Examples of projects which might involve such impacts may include (but are not necessarily limited to) those involving the construction of new roadways, new transit/rail facilities, new parking areas, new bike paths or pedestrian trails, and the widening of existing roadways. This could represent a **potentially significant environmental impact** associated with those projects which involve construction activity.

RECOMMENDED MITIGATION MEASURE

**MITIGATION MEASURE 3.3.1: Construction Emission Control Measures/Scheduling**

A. Implementing agencies shall, where appropriate, apply MBUAPCD-recommended measures for reducing construction emissions for specific transportation system improvement projects involving minimal earthmoving over an area of 8.1 acres or more per day, or involving grading and excavation over an area of 2.2 acres or more per day. Specific measures shall, where appropriate, be approved by the MBUAPCD as part of the permitting process, and shall, where appropriate, include (but not be limited to) the following, as appropriate:

- Water all construction areas at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure;
- Prohibit all grading activities during periods of high winds (over 15 MPH);
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days);
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed areas;
- Haul trucks shall, where appropriate, maintain at least two feet of freeboard;
- Cover all trucks hauling dirt, sand and/or loose materials;
- Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land;
- Plant vegetative cover in disturbed areas as soon as possible;
- Cover inactive storage piles;
- Install wheel washers at the entrance to construction sites for all exiting trucks;
- Pave all roads on construction sites;
- Sweep street if visible soil material is carried out from the construction site;
- Post a visible sign which specifies the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within

48 hours. The phone number of the Monterey Bay Unified Air Pollution Control District shall, where appropriate, be visible to ensure compliance with Rule 402 (Nuisance); and/or

- Limit the area under construction at any one time.

B. Implementing agencies shall, where appropriate, ensure that ground disturbance is phased to the extent possible to minimize the creation of fugitive dust.

C. If the use of non-typical construction equipment (e.g., grinders and portable equipment) is contemplated, implementing agencies shall, where appropriate, consult with the MBUAPCD, and shall, where appropriate, ensure that the Best Available Control Technology (BACT) is implemented to reduce short-term NOx emissions during construction activity, where appropriate. BACT measures shall, where appropriate, include two-degree timing retard, high pressure fuel injectors and reformulated diesel fuel, if available. These measures shall, where appropriate, be noted on all construction plans, and the local jurisdiction shall, where appropriate, perform periodic site inspections.

RESULTING LEVEL OF SIGNIFICANCE

The use of the dust control measures identified above could generally be expected to reduce the construction-related air quality impacts associated with the implementation of the transportation system improvement projects identified in the financially constrained Action Elements of the three plans to a level of less than significant.

**Carbon Monoxide Hotspots**

Although implementation of the transportation system improvement projects identified in the financially constrained Action Elements of the three plans would be expected to have a generally positive effect on overall levels of carbon monoxide (since average vehicle speeds would be increased), it is possible that some of the proposed roadway improvement projects could result in local increases in carbon monoxide concentrations. Under MBUAPCD CEQA Air Quality Guidelines (June 2004, page 5-5, Table 5-3), specific projects that degrade LOS at an intersection/road segment from D or better to E or F or increases the V/C ratio at an intersection/road segment at LOS E or F by 0.05 or more or increases delay at an intersection at LOS E or F by 10 seconds or more or decreases reserve capacity at an unsignalized intersection at LOS E or F by 50 or more could have potentially significant effects associated with carbon monoxide emissions.

Modeling should be conducted to determine whether a specific project would cause of substantially contribute (550 pounds per day) to exceedance of carbon monoxide AAQS (if not, such a project would not have a significant impact). Additional project-level environmental evaluation of the major roadway improvement projects listed in the financially constrained Action Elements of the three plans should provide a more detailed analysis of the project-specific carbon monoxide impacts which may be associated with these particular projects.

**IMPACT 3.3.2: Carbon Monoxide Emissions.** Individual projects identified in the financially constrained Action Elements of the three plans may have an adverse effect on local carbon monoxide levels, particularly where the construction of airport, rail stations and park-and-ride lots may result in increased traffic congestion in the vicinity. This could represent a **potentially significant environmental impact** associated with these types of projects.

RECOMMENDED MITIGATION MEASURE

**MITIGATION MEASURE 3.3.2: Prevention of Carbon Monoxide Hot Spots**

Where implementing agencies propose transportation system improvement projects that may cause an exceedance of MBUAPCD thresholds for CO modeling, the local jurisdiction shall, where appropriate, improve the circulation system in which the project is proposed such that all roadways and intersections affected by the project maintain an acceptable level of service, or shall, where appropriate, conduct CO modeling to demonstrate that the concentration of CO will remain below the relevant CO AAQS. This may involve a reduction in the size of the project, relocation of the project or a reconfiguration of project elements.

RESULTING LEVEL OF SIGNIFICANCE

This mitigation measure could reduce this potential impact which may be associated with the implementation of specific transportation system improvement projects identified in the financially constrained Action Elements of the three plans to a level of less than significant.

**Toxic Air Contaminants**

**IMPACT 3.3.3: Toxic Air Contaminant Emissions.** Implementation of some transportation system improvement projects identified in the financially constrained Action Elements of the three plans could result in increased exposure of sensitive receptors to toxic air contaminants (TACs) associated with the construction and operation of these improvements, including (but not limited to) the particulate fraction of diesel exhaust. Diesel exhaust from construction activity may have chronic and/or acute risks, depending on the duration of construction activity, proximity to sensitive receptors, and the amount and type of construction equipment to be used. The health risks associated with exposure to diesel exhaust is greatest for children, the elderly and the chronically or acutely ill, and an increase in the exposure of sensitive receptors to TACs could represent a **potentially significant environmental impact** that might be associated with projects that involve construction involving diesel-powered equipment, an increase in the use of diesel-fueled vehicles within a limited area, or along roadways that could experience an increase in diesel-fueled vehicle traffic as a result of the implementation of transportation system improvement projects. Such projects could include those involving earth-moving or the use of diesel-powered construction equipment, transit stations served by diesel-fueled vehicles, transit maintenance and parking facilities, and those projects resulting in increased diesel train service, either along existing rail lines or on proposed future rail lines, as well as projects that would increase roadway capacities.

RECOMMENDED MITIGATION MEASURE

**MITIGATION MEASURE 3.3.3: Reduction in Diesel Emissions**

Individual transportation system improvement projects that involve construction activity requiring the use of diesel-powered equipment, truck idling, train idling or increased diesel-fueled traffic shall, where appropriate, be subject to a screening level risk assessment by the implementing agency, then to a full risk assessment where warranted following the screening risk assessment. If these project-specific assessment procedures (outlined in the MBUAPCD CEQA Guidelines, Appendix C) indicate that a project would exceed the MBUAPCD's cancer risk threshold of 10 per million, or the chronic hazard index is above one, then the following mitigation measures should be applied to such projects, where appropriate:

Construction-Related Diesel Exhaust

- Prior to initiating construction activity, the implementing agency should consult with the MBUAPCD to identify the types of grading, demolition and construction equipment that will be used for the project. Once the characteristics of specific equipment to be used have been identified, the MBUAPCD should provide recommendations for measures that can be implemented to reduce diesel emissions associated with such equipment (e.g., the substitution of diesel-powered equipment with non-diesel-powered equipment, the installation of exhaust controls, staggering construction activity at the project site, etc.).

Truck Idling Facilities

- Provide a minimum buffer zone of 300 meters between truck traffic and sensitive receptors;
- Re-route truck traffic by adding direct off-ramps for the truck traffic or by restricting truck traffic on certain sensitive routes;
- Improve traffic flow by signal synchronization;
- Enforce truck parking restrictions;
- Develop park and ride programs;
- Restrict truck idling;
- Restrict operation at the truck idling facility to "clean trucks";
- Electrify service equipment at facility;
- Provide electrical hook-ups for trucks that need to cool their load;
- Use "clean" street sweepers;

- Provide onsite services to minimize truck traffic in or near residential areas, including, but not limited to, the following services: meal or cafeteria service, automated teller machines, etc.; and
- Require or provide incentives to use low-sulfur diesel fuel with particulate traps.

Train Idling

- Change railroad operating practices to reduce idle time;
- Employ idle reduction technologies (such as auxiliary power units); and
- Employ new engine technologies (such as modification of fuel injectors).

Generally, transit operators within the Monterey Bay region should consider the use of alternative fuels, where appropriate and available, as a means of reducing diesel emissions associated with transit vehicles.

RESULTING LEVEL OF SIGNIFICANCE

Depending on the project-specific diesel emission characteristics, this mitigation measure could be expected to reduce diesel particulate material emissions which may be associated with the implementation of specific transportation system improvement projects identified in the financially constrained Action Elements of the three plans to some extent, most often to a level of less than significant. However, for a few projects where identified measures intended to reduce diesel particulate material emissions cannot be effectively implemented to reduce these emissions to a level below the MBUAPCD's cancer risk threshold or to obtain a chronic hazard index of one or less, this impact could remain **significant and unavoidable**.

**Odors**

**IMPACT 3.3.4: Increased Exposure to Diesel Exhaust Fumes.** Implementation of some of the transportation system improvement projects identified in the financially constrained Action Elements of the three plans involving an increase in diesel exhaust levels at construction sites, within limited areas (e.g., transit stations, transit maintenance and parking facilities, along rail lines which would support increased train service, etc.) or along roadways that could experience an increase in diesel-fueled vehicle traffic as a result of the implementation of transportation system improvement projects could result in potential exposure of sensitive receptors to objectionable odors. This could represent a **potentially significant environmental impact**.

RECOMMENDED MITIGATION MEASURE

Same as **MITIGATION MEASURE 3.3.3: Reduction in Diesel Emissions**

RESULTING LEVEL OF SIGNIFICANCE

Depending on the project-specific diesel emission characteristics, the effective implementation of **MITIGATION MEASURE 3.3.3** could be expected to reduce odors associated with project-specific diesel emissions to some extent, most often to a level of less than significant. However, for a few projects where identified measures intended to reduce diesel particulate material emissions cannot be effectively implemented to reduce these emissions to a level below the MBUAPCD's cancer risk threshold or to obtain a chronic hazard index of one or less, this impact could remain **significant and unavoidable**.