CHAPTER 3
CLIMATE AND AIR QUALITY

UPDATE CHRONOLOGY

NOVEMBER 30, 2005—VERSION 1

LOOKING UP IN NAPA VALLEY

PURPOSE

This chapter describes existing conditions that affect air quality, including meteorological conditions and current levels of criteria pollutants, in Napa County. The data assembled provide a basis for future regional and planning and help identify opportunities for enhancing air quality. It will also serve as a basis to evaluate current and future policies at the local and Countywide level as they relate to air quality.

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LIST OF ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
ARB	Air Resources Board
BAAQMD	Bay Area Air Quality Management District
BAOS	Bay Area Ozone Strategy
BDR	Napa County Baseline Data Report
CAA	Federal Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	California ambient air quality standards
CAP	Bay Area Clean Air Plan
CCAA	California Clean Air Act of 1988
CEQA	California Environmental Quality Act
County	Napa County
EPA	U.S. Environmental Protection Agency
$\mu g/m^3$	Micrograms per cubic meter
mph	Miles per hour
MTC	Metropolitan Transportation Commission
MVEB	Motor vehicle emissions budget
NAAQS	National ambient air quality standards
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NEPA	National Environmental Policy Act
OAP	Ozone Attainment Plan
PM10	Particulate matter
ppm	Parts per million
RACM	Reasonably available control measures
ROG	Reactive organic gases
SFBAAB	San Francisco Bay Area Air Basin
SIP	State Implementation Plan
SO_2	Sulfur dioxide
TAC	Toxic air contaminants
v/c	Volume to capacity

INTRODUCTION

This chapter provides baseline information for existing climate and air quality conditions in Napa County (County). This chapter introduces national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), as well as the overall policy framework for air quality management in California and the Napa County region. Information presented herein is based in part on guidance provided by the Bay Area Air Quality Management District (BAAQMD). Climate information for precipitation was derived from the data collection and analysis effort conducted in support of Chapter 15, *Surface Water Hydrology*, of the Napa County Baseline Data Report (BDR).

SPECIALIZED TERMS USED

- *Attainment*: Any area that meets an ambient air quality standard for a given pollutant is considered in attainment for that pollutant.
- *Criteria pollutants*: Six pollutants (ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxide) for which the U.S. Environmental Protection Agency (EPA) has set standards to protect human health and welfare. They are used as indicators of air quality.
- *Isohyetal*: Rainfall depth contours or spatial presentation of rainfall amounts.
- *National Ambient Air Quality Standards (NAAQS)*: Health-based pollutant concentration limits established by the EPA above which adverse effects on human health may occur.
- *Nonattainment*: Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for a pollutant is considered in nonattainment for that pollutant.
- *Rain shadow*: Significant drop in precipitation amounts on the leeward side of a mountain.
- *Unclassifiable*: Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for a certain pollutant is considered unclassified for that pollutant.
- *Wind Rose*: A graphical representation of the wind speed and wind direction at a particular location, usually representing measurements taken over a period of at least 1 year. The information in the wind rose typically depicts the average wind speed by wind direction, as well as the percentage of frequency by wind direction.

Air quality management districts oversee agricultural burning permits.

POLICY CONSIDERATIONS

This section discusses the federal, state, and local policies that are relevant to the analysis of air quality in the County.

The federal and California state governments have established standards for several different pollutants. In the case of some pollutants, separate standards and measurement periods have been established. Most standards have been established to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). The pollutants of greatest concern in the County are carbon monoxide (CO), ozone, and particulate matter 10 and 2.5 microns or less in diameter (PM10 and PM2.5, respectively), which are inhalable. Table 3-1 shows the state and federal standards for a variety of pollutants.

FEDERAL POLICIES

The federal Clean Air Act (CAA), promulgated in 1970 and amended twice thereafter (including the 1990 amendment), establishes the framework for modern air pollution control. The act directs the U.S. Environmental Protection Agency (EPA) to establish ambient air standards for six pollutants: ozone, CO, lead, nitrogen dioxide (NO_2), particulate matter, and sulfur dioxide (SO_2). The standards are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the EPA. The EPA develops rules and regulations to preserve and improve air quality, as well as delegating specific responsibilities to state and local agencies.

FEDERAL CONFORMITY REQUIREMENTS

The CAAA require that all federally funded projects come from a plan or program that conforms to the appropriate State Implementation Plan (SIP). Federal actions are subject to either the transportation conformity rule (40 CFR 51[T]), which applies to federal highway or transit projects, or the general conformity rule.

The purpose of the general conformity rule is to ensure that federal projects conform to applicable SIPs so that they do not interfere with strategies employed to attain the NAAQS. The rule applies to federal projects in areas designated as nonattainment areas for any of the six criteria pollutants and in some areas designated as maintenance areas. The rule applies to all federal projects except

- programs specifically included in a transportation plan or program that is found to conform under the federal transportation conformity rule,

- projects with associated emissions below specified de minimis threshold levels, and
- certain other projects that are exempt or presumed to conform.

A general conformity determination must be performed to demonstrate that emissions for each affected pollutant would conform with the applicable SIP if a proposed action's total direct and indirect emissions for any pollutant for which the region is classified as being a maintenance or nonattainment area for the national standards fail to meet either of the following two conditions.

- Emissions are below the applicable de minimis levels.
- Emissions are regionally insignificant (i.e., total emissions are less than 10% of the area's total emissions inventory for that pollutant).

If the above two conditions are met, however, the requirements for general conformity do not apply, because the proposed action is presumed to conform with the applicable SIP for each affected pollutant. As a result, no further analysis or determination would be required.

STATE POLICIES

Responsibility for achieving California's standards, which are more stringent than federal standards, is placed on the Air Resources Board (ARB) and local air districts and is to be achieved through district-level air quality management plans that will be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to the ARB, which, in turn, has delegated that authority to individual air districts

The ARB traditionally has established state air quality standards by maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving state implementation plans.

Responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing sections related to air quality of environmental documents required by the California Environmental Quality Act (CEQA).

The California Clean Air Act of 1988, as amended (California CCAA) substantially added to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging (measurement) periods, are more stringent than the comparable federal standards.

The CCAA requires designation of attainment and nonattainment areas with respect to state ambient air quality standards. The CCAA also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates state air quality standards for CO, sulfur dioxide, nitrogen dioxide, or ozone. These clean air plans are specifically designed to attain these standards and must be designed to achieve an annual 5% reduction in district-wide emissions of each nonattainment pollutant or its precursors. No locally prepared attainment plans are required for areas that violate the state PM10 standards.

The CCAA requires that the state air quality standards be met as expeditiously as practicable but, unlike the federal CAA, does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

Soscol Water Recycling Facility collects and recycles methane gas for power production.

LOCAL AND REGIONAL POLICIES

At the local county level, air quality is managed through land use and development planning practices. These practices are implemented in Napa County through the general planning process (i.e., Napa County General Plan).

At the regional level, the BAAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. These rules and regulations are described below.

OZONE ATTAINMENT PLAN

The Ozone Attainment Plan (OAP) is the Bay Area's portion of California's SIP to achieve the national ozone standard.

In 1999 the BAAQMD, Association of Bay Area Governments (ABAG), and the Metropolitan Transportation Commission (MTC) adopted the 1999 OAP, which was submitted to the California ARB in June 1999. The 1999 OAP was approved by the ARB in July 1999 and then submitted to the EPA for approval. The EPA proposed to partially approve and partially disapprove (the reasonably available control measures [RACMs] demonstration, the attainment demonstration, and the motor vehicle emissions budgets [MVEBs]) portions of the 1999 OAP on March 30, 2001. This disapproval action by the EPA started a sanctions clock, and the Bay Area became subject to the imposition of a 2-to-1 offset sanction.

Other responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, and reviewing sections related to air quality of environmental documents required by CEQA.

In response, the BAAQMD, ABAG, and MTC began preparation of the 2001 OAP to correct the deficiencies in the 1999 OAP. On October 24, 2001, the BAAQMD, ABAG, and MTC adopted the 2001 OAP. The 2001 OAP was approved by the ARB on November 1, 2001, and submitted to the EPA for approval as a revision to the California SIP on November 30, 2001. The 2001 OAP included two commitments for further planning—a commitment to conduct a mid-course review of progress toward attaining the national 1-hour ozone standard by December 2003, and a commitment to provide a revised ozone attainment strategy to the EPA by April 2004. On April 22, 2004, the EPA approved the

Table 3-1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria	
			California	National	California	National	California	National
Ozone*	O_3	1 hour	0.09	NA	180	NA	If exceeded	NA
		8 hours	0.070	0.08	137	157	If exceeded	If fourth highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor within an area
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20.0	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	NA	7,000	NA	If equaled or exceeded	NA
Nitrogen dioxide	NO_2	Annual average	NA	0.053	NA	100	NA	If exceeded on more than 1 day per year
		1 hour	0.25	NA	470	NA	If exceeded	NA
Sulfur dioxide	SO_2	Annual average	NA	0.03	NA	80	NA	If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	NA	655	NA	If exceeded	NA
Hydrogen sulfide	H_2S	1 hour	0.03	NA	42	NA	If equaled or exceeded	NA
Vinyl chloride	C_2H_3Cl	24 hours	0.01	NA	26	NA	If equaled or exceeded	NA
Inhalable particulate matter	PM10	Annual geometric mean	NA	NA	20	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	NA	50	NA	If exceeded at each monitor within area
		24 hours	NA	NA	50	150	If exceeded	If exceeded on more than 1 day per year
	PM2.5	Annual geometric mean	NA	NA	NA	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	12	15	NA	If 3-year average from single or multiple community-oriented monitors is exceeded
		24 hours	NA	NA	NA	65	NA	If 3-year average of 98th percentile at each population-oriented monitor within an area is exceeded
Sulfate particles	SO_4	24 hours	NA	NA	25	NA	If equaled or exceeded	NA
Lead particles	Pb	Calendar quarter	NA	NA	NA	1.5	NA	If exceeded no more than 1 day per year
		30-day average	NA	NA	1.5	NA	If equaled or exceeded	NA

Notes:

All standards are based on measurements at 25ºC and 1 atmosphere pressure.

National standards shown are the primary (health effects) standards.

NA = not applicable.

* The U.S. Environmental Protection Agency recently replaced the 1-hour ozone standard with an 8-hour standard of 0.08 part per million. EPA issued a final rule that will revoke the 1-hour standard on June 15, 2005. However, the California 1-hour ozone standard will remain in effect.

Source: California Air Resources Board 2003.

following elements of the 2001 OAP: emissions inventory, RACMs, commitments to adopt and implement specific control measures, MVEBs, and commitments for further study measures. The EPA's approval of RACMs and the MVEBs in the 2001 OAP terminates the sanctions clock for those plan elements.

The EPA made a final finding in April 2004 that the BAAQMD had attained the national 1-hour ozone standard. As a result, certain planning commitments outlined in the 2001 OAP were no longer required. While the EPA has prepared a finding of attainment for the region, the Bay Area has not been formally reclassified as an attainment area for the 1-hour standard. In order to be reclassified as an attainment area, the region must submit a redesignation request to the EPA.

CLEAN AIR PLAN

Napa County lies within the San Francisco Bay Area Air Basin (SFBAAB).

The Bay Area Clean Air Plan (CAP) is a plan to reduce ground-level ozone levels in the San Francisco Bay Area and attain the state 1-hour ozone standard. It was developed by the BAAQMD, in cooperation with ABAG and MTC, in response to the CCAA. The CCAA requires all air districts exceeding the state ozone standard to reduce pollutant emissions by 5% per year, calculated from 1987, or achieve emission reductions through all feasible measures. The CCAA further requires that the CAP be updated every 3 years. As the Bay Area attained the state CO standard in 1993, the CCAA planning requirements for CO nonattainment areas no longer apply to the Bay Area. The first CAP, prepared in 1991, includes a comprehensive strategy to reduce air pollutant emissions by focusing on control measures to be implemented during the periods from 1991 to 1994 and 1995 through 2000 and beyond.

The update to the 1991 CAP, the 1994 CAP, continues the comprehensive strategy established by the 1991 CAP and continues its goals of reducing health impacts from ozone levels above the state ambient standard to compliance with the CCAA. The 1994 CAP includes eight new proposed control measures for stationary and mobile source in addition to changes in the organization and scheduling some of the control measures from the 1991 CAP. The control measures proposed in the 1994 CAP constitute all feasible ozone-reducing measures in the Bay Area. In addition, the 1994 CAP projects pollutant trends and possible control activities beyond 1997.

The BAAQMD adopted the most recent update of the CAP on December 20, 2000. It is the third triennial update of the district's original 1991 CAP. The 2000 CAP includes a review of control strategies to ensure that "all feasible measures" to reduce ozone are incorporated into the CAP. In addition, the 2000 CAP updates the district's emission inventory, provides an estimate of emission reductions resulting from the CAP, and assesses air quality trends in the region.

BAY AREA OZONE STRATEGY

The BAAQMD is in the process of preparing the Bay Area Ozone Strategy (BAOS) in cooperation with ABAG and MTC. The BAOS will address the federal and state air quality planning requirements. For the national planning requirements, the BAOS will include a maintenance plan for the national 1-hour ozone standard, in addition to a request for redesignation for attainment for the 1-hour federal standard. To address the state planning requirements, the BAOS will include a triennial update to the district's CAP to attain the state 1-hour ozone standard. The BAOS will assess the district's progress toward attainment of both ozone standards, review air pollution control strategies, and determine what additional control strategies will be required to meet the standards.

METHODOLOGY

This section presents the methods used to identify and evaluate climate conditions and air quality emissions in Napa County.

DEFINITION OF STUDY AREA

The study area is the entirety of Napa County, and includes all jurisdictions and municipalities contained within the County. Napa County lies within the San Francisco Bay Area Air Basin (SFBAAB). The BAAQMD regulates air quality conditions in the SFBAAB. The region is classified as a nonattainment area for several air pollutants, as described below.

RESOURCES CONSULTED

Existing studies and relevant information regarding climate and air quality were reviewed. Those sources are cited where appropriate, and full references are provided below in the *References Cited* section of this chapter.

CRITERIA POLLUTANTS

Countywide emissions of criteria pollutants were obtained from the ARB. The following criteria pollutants were assessed in this analysis.

- Ozone (O_3).
- Carbon monoxide (CO).
- Oxides of nitrogen (NO_X).
- Sulfur dioxide (SO_2).
- Particulate matter 10 and 2.5 microns or less in diameter (PM10 and PM2.5, respectively).
- Lead (pb).

PROCEDURES FOR MODELING CARBON MONOXIDE CONCENTRATIONS

ROADWAY AND TRAFFIC CONDITIONS

Carbon monoxide (CO) modeling was performed for existing conditions using traffic data prepared by the project traffic engineers, Fehr & Peers. CO modeling was conducted using peak-hour traffic volumes. Intersection peak-hour traffic volumes were not available for this analysis. Consequently, the analysis of CO concentrations (hot spots) was conducted using roadway segment data provided by the project traffic engineers.

The following roadway segments were modeled because they represent roadways with the highest daily traffic volumes and/or highest level of congestion (volume to capacity [V/C] ratio). As such, impacts at these locations would be higher than at any of the other affected roadways.

- State Highway 29: Kelly Rd to Jamieson Cyn Rd (SR 12).
- State Highway 29: Lincoln Ave to Old Sonoma Rd.
- State Highway 29: Rutherford Cross Rd (SR 128) to Oakville Grade.
- State Highway 29: Pope St to Chaix Ln.
- State Highway 128: Petrified Forest Rd to Lincoln Ave (SR 29).
- Sage Canyon Rd: Chiles-Pope Valley Rd to Silverado Trail.
- State Highway 128: Monticello Rd (SR 121) to Berryessa-Knoxville Rd.
- State Highway 12: Napa/Solano Co Line to Lynch Rd.
- American Canyon Rd: Flosden Rd to Napa-Vallejo Hwy (SR 29).
- Washington St: Madison St to California Dr.
- Imola Ave: Napa City Limits to Soscol Ave (SR121).
- Partrick Rd: Napa City Limit to Highway 29.
- Dry Creek Rd: Oakville Grade to Orchard Ave.
- Wooden Valley Rd: Monticello Rd (SR 121) to Napa/Solano Co Line.
- Berryessa Knoxville Rd: Napa/Lake Co Line to Pope Canyon Rd.
- Howell Mountain Rd: Cold Springs Rd to Deer Park Rd.
- Pope Valley Rd: Snell Valley Rd to Howell Mountain Rd.

VEHICLE EMISSION RATES

Vehicle emission rates were determined using the ARB's EMFAC2002 (version 2.2) emission rate program. A mean January temperature of 37 degrees Fahrenheit and humidity of 80% were assumed based on historical weather data. Free flow traffic speeds were adjusted to reflect congested speeds using methodology from the Highway Capacity Manual (Transportation Research Board 2000).

RECEPTOR LOCATIONS

CO concentrations were estimated at receptor locations placed 50 feet from the modeled roadway edge of pavement to represent a worst-case scenario. Receptor heights were set at 5.9 feet.

METEOROLOGICAL CONDITIONS

Meteorological inputs to the CALINE4 model were determined using methodology recommended in the CO protocol (Garza et al. 1997). The meteorological conditions used in the modeling represent a calm winter period. The worst-case wind angles option was used to determine a worst-case concentration for each receptor. The meteorological inputs include 0.5-meter-per-second wind speed, ground-level temperature inversion (atmospheric stability class G), wind direction standard deviation equal to 30 degrees, ambient temperature of 2.78 degrees centigrade (37 degrees Fahrenheit), altitude at sea level, and a mixing height of 1,000 meters.

BACKGROUND CONCENTRATIONS AND 8-HOUR VALUES

To account for sources of CO not included in the modeling, 1- and 8-hour background concentrations of 4.0 and 2.3 ppm were added to the modeled 1-hour and 8-hour values, respectively. All background concentration data were taken from the monitoring data provided by the ARB (California Air Resources Board 2005) to represent a worst-case scenario. Actual 1-hour and 8-hour background concentrations would likely be lower than those used in the CO modeling analysis because the average value for the previous three years was applied as background concentrations, and background levels of CO are anticipated to lower as older, more polluting vehicles are replaced with cleaner, less polluting vehicles. Modeled 8-hour values were calculated from the 1-hour values using a persistence factor of 0.6.

Rainfall patterns in Napa County are strongly correlated to elevation—the higher the elevation, the more rainfall received.

Due to the climate and terrain of Napa Valley, the potential for air pollution could be high if there were sufficient sources of air contaminants nearby.

EXISTING AIR QUALITY CONDITIONS

This section characterizes existing air quality conditions and describes regional pollutants of concern within Napa County.

REGIONAL CLIMATE AND METEOROLOGY

The study area is Napa County, which lies within the Napa Valley, which is bordered by relatively high mountains. The mountains surrounding the Napa Valley have an average ridgeline height of approximately 2,000 feet, while some peaks approach 3,000 to 4,000 feet in elevation. The Napa Valley is widest at its southern end and narrows to the north, and the mountains surrounding the valley serve as effective barriers to the prevailing northwesterly winds.

In the daytime, the prevailing winds flow upvalley from the south about half of the time, with a strong upvalley wind frequently developing during warm summer afternoons, which draws in air from the San Pablo Bay. Occasionally daytime winds will flow downvalley from the north. Downvalley drainage often occurs in the evening, especially in the winter months. Wind speeds are generally low, with almost 50% of the winds speeds below 4 miles per hour (mph). Only 5% of the wind speeds are between 16 and 18 mph; such speeds are representative of winter storms and strong summertime upvalley winds. The wind rose presented in Figure 3-1 summarizes the predominant wind direction and average wind speeds in the City of Napa. Map 3-1 indicates the location of the monitoring stations where wind data used to prepare the wind rose was collected. (All maps appear at the end of the chapter.) The wind rose presented in Figure 3-1 is a graphical representation of the wind speed and wind direction in the City of Napa for over the 1-year period of 2001. The information in the wind rose depicts the average wind speed by wind direction in meters per second, as well as the percentage of frequency by wind direction.

The summer average maximum temperatures are in the low 80s at the southern end of the valley and in the low 90s at the northern end, while winter average maximum temperatures are in the high 50s and low 60s, with minimum temperatures in the high to mid 30s in the slightly cooler northern end of the valley. Due to the climate and terrain of the valley, the potential for air pollution could be high if there were sufficient sources of air contaminants nearby. The summer and fall prevailing winds can transport ozone precursors northward from the Carquinez Strait Region to the Napa Valley, which would effectively trap and concentrate pollutants when stable conditions are present. In addition, pollutants may be recirculated by the local upslope and downslope flows created by the surrounding mountains, contributing to buildup of air pollution within the valley. In the late fall and winter, particulate matter from motor vehicles, agriculture and woodburning in fireplaces and stoves can build up in the valley because of the high frequency of light winds and stable atmospheric conditions.

Tables 3-2 and 3-3 summarize weather data from California Irrigation Management Information System monitors in Oakville and Carneros, respectively. (Map 3-1 identifies the locations of the monitoring stations.)

Map 3-2 shows equal annual rainfall contours (isohyetal). This map was developed from current and available information collected for Chapter 15, *Surface Hydrology*, of this Napa County Baseline Data Report (BDR). The rainfall stations used to develop the isohyetal contour map are shown in Map 3-2.

In terms of general precipitation patterns, Map 3-2 indicates that rainfall distribution is strongly correlated with elevation. For example, average annual rainfall along a transect may range from the hills south of Calistoga (~45 in/yr), across the valley floor near Calistoga (~30 in/yr), and then up the hills north of Calistoga (more than 45 in/yr). A strong “rain shadow” effect is also observed in the County, whereby rainfall amounts decrease eastward because frontal storms arriving from the Pacific Coast lose moisture and saturation as they pass over progressive ridgelines to the east. As observed in the eastern area of the County towards Knoxville/Berryessa, average annual precipitation is about less then 15 in/year compared to the more moist western county.

Precipitation intensity conditions are also described in Chapter 15, *Surface Hydrology*, of the BDR (see Table 15-2).

CRITERIA POLLUTANTS AND LOCAL AIR QUALITY

DESCRIPTION OF POLLUTANTS

The federal and state governments have established ambient air quality standards for six criteria pollutants: ozone, CO, NO_2, SO_2, particulate matter, and lead. Ozone, and NO_2 are generally considered regional pollutants because these pollutants or their precursors affect air quality on a regional scale. Pollutants such as CO, SO_2, and lead are considered local pollutants because they tend to accumulate in the air locally. Particulate matter is considered a localized pollutant and a regional pollutant. In the study area, ozone, CO, and particulate matter are of particular concern. Brief descriptions of these pollutants follow.

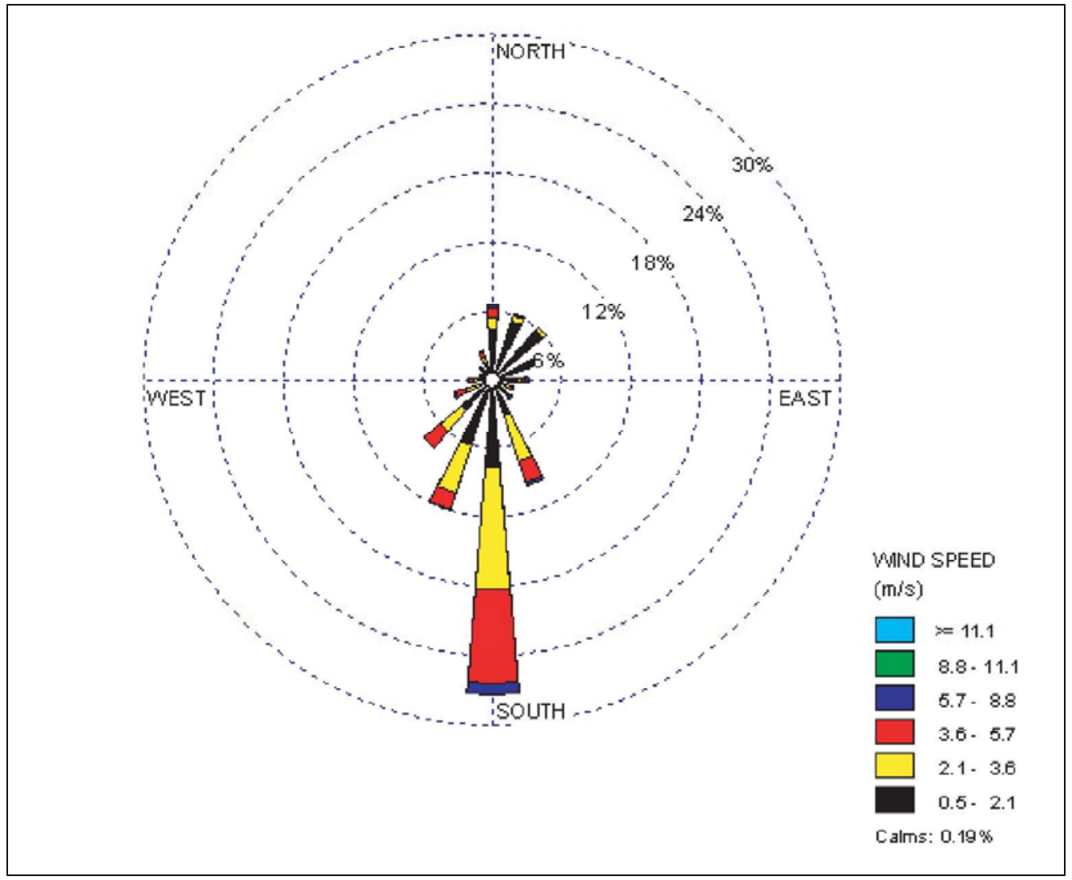

Figure 3-1. City of Napa—Predominant Wind Speed and Direction

OZONE

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials and causes extensive damage to plants by leaf discoloration and cell damage.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen (NO_X), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors ROG and NO_X are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for ozone have been set for an 8-hour averaging time. The state 8-hour standard is 0.070 parts per million (ppm), not to be exceeded, while the federal 8-hour standard is 0.08 ppm, not to be exceeded more than three times in any 3-year period. The state has established a 1-hour ozone standard of 0.09 ppm, not to be exceeded, while the federal 1-hour ozone standard of 0.12 ppm has recently been replaced by the 8-hour standard. State and federal standards are summarized in Table 3-1.

CARBON MONOXIDE

CO is essentially inert to plants and materials but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for both 1- and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. State and federal standards are summarized in Table 3-1.

INHALABLE PARTICULATE MATTER

Particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials.

The federal and state ambient air quality standard for particulate matter applies to two classes of particulates: PM10 and PM2.5. The state PM10 standards are 50 micrograms per cubic meter ($\mu g/m^3$) as a 24-hour average and 20 $\mu g/m^3$ as an annual geometric mean. The federal PM10 standards are 150 $\mu g/m^3$ as a 24-hour average and 50 $\mu g/m^3$ as an annual arithmetic mean. The federal PM2.5 standards are 15 $\mu g/m^3$ for the annual average and 65 $\mu g/m^3$ for the 24-hour average. The state PM2.5 standard is 12 $\mu g/m^3$ as an annual geometric mean. State and federal standards are summarized in Table 3-1.

TOXIC AIR CONTAMINANTS

Toxic air contaminants (TACs) are pollutants that may be expected to result in an increase in mortality or serious illness or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. The ARB has identified diesel exhaust particulate matter as a TAC.

Diesel exhaust is a toxic air contaminant.

Table 3-2. Average Monthly Weather Conditions at the Oakville Monitoring Station

Month	Total Precipitation (inches)	Average Maximum Air Temperature (°F)	Average Minimum Air Temperature (°F)	Average Air Temperature (°F)	Average Maximum Relative Humidity (%)	Average Minimum Relative Humidity (%)	Average Relative Humidity (%)	Average Dew Point (°F)	Average Wind Speed (mph)
January	7.12	58.15	38.80	47.43	95.87	62.33	82.47	41.89	3.21
February	7.48	60.69	39.44	49.71	96.13	56.13	80.19	43.39	3.56
March	4.71	66.50	41.77	53.33	95.31	51.94	75.56	45.19	3.93
April	1.93	71.04	43.17	56.64	93.63	42.56	66.94	45.06	4.51
May	1.40	76.68	46.56	61.29	93.44	41.63	65.19	48.65	4.38
June	0.36	82.51	49.41	65.90	91.56	38.81	62.00	51.33	4.44
July	0.00	85.28	51.41	67.22	92.88	35.38	64.56	54.42	4.09
August	0.33	86.10	50.95	67.03	93.81	38.38	64.81	54.29	3.96
September	0.12	84.47	48.64	65.06	93.31	36.75	63.56	51.58	3.51
October	1.48	77.45	44.83	59.79	89.94	36.75	63.06	46.16	3.16
November	3.79	65.94	40.25	51.85	88.19	49.07	73.31	42.23	2.92
December	7.48	58.72	37.89	47.22	93.75	55.50	78.88	39.74	3.21

Source: California Irrigation Management Information System 2005

Table 3-3. Average Monthly Weather Conditions at the Carneros Monitoring Station

Month	Total Precipitation (inches)	Average Maximum Air Temperature (°F)	Average Minimum Air Temperature (°F)	Average Air Temperature (°F)	Average Maximum Relative Humidity (%)	Average Minimum Relative Humidity (%)	Average Relative Humidity (%)	Average Dew Point (°F)	Average Wind Speed (mph)
January	4.61	56.82	38.94	47.46	97.45	70.55	88.36	44.03	3.95
February	4.85	60.22	39.45	49.60	97.27	62.82	83.64	44.54	4.34
March	2.24	65.59	40.59	52.78	96.75	55.00	78.67	45.93	4.57
April	1.33	67.47	41.11	54.33	96.17	53.00	75.58	46.40	5.53
May	1.05	72.66	44.72	58.66	95.83	50.58	73.83	50.05	5.53
June	1.04	78.88	47.58	62.94	95.25	44.42	68.50	51.92	5.73
July	0.00	79.90	49.92	63.86	95.58	47.08	71.92	54.35	5.85
August	0.07	81.78	49.67	64.48	95.75	43.75	70.67	54.43	5.36
September	0.07	81.03	47.88	63.08	94.50	40.83	68.08	51.77	4.84
October	0.78	75.08	43.51	58.21	93.17	41.83	68.33	46.70	4.28
November	2.83	63.92	39.27	51.01	96.33	56.33	80.25	44.67	3.54
December	4.06	57.26	37.09	46.77	97.50	65.50	85.58	42.41	3.93

Source: California Irrigation Management Information System 2005

EXISTING AIR QUALITY CONDITIONS

The existing air quality conditions in the County can be characterized by monitoring data collected in the region. The nearest air quality monitoring station in the vicinity of the study area is the Jefferson Avenue monitoring station in the City of Napa. Air quality monitoring data from the Jefferson Avenue monitoring station are summarized in Table 3-4. These data represent air quality monitoring data for the last 3 years (2002–2004) for which complete data are available. The location of the Jefferson Avenue monitoring station is indicated in Map 3-1.

Table 3-4. Ambient Air Quality Monitoring Data Measured at the Jefferson Avenue Monitoring Station

Pollutant Standards	2002	2003	2004
Ozone			
Maximum 1-hour concentration (ppm)	0.116	0.105	0.092
Maximum 8-hour concentration (ppm)	0.082	0.083	0.072
Number of days standard exceeded[a]			
NAAQS 1-hour (>0.12 ppm)	0	0	0
CAAQS 1-hour (>0.09 ppm)	1	2	0
NAAQS 8-hour (>0.08 ppm)	0	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	2.36	2.49	2.00
Maximum 1-hour concentration (ppm)	4.2	4.7	3.7
Number of days standard exceeded[a]			
NAAQS 8-hour (≥9.0 ppm)	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0
Particulate Matter (PM10)[b]			
National[c] maximum 24-hour concentration ($\mu g/m^3$)	66.9	40.6	59.2
National[c] second-highest 24-hour concentration ($\mu g/m^3$)	57.9	37.2	40.0
State[d] maximum 24-hour concentration ($\mu g/m^3$)	69.9	30.8	--
State[d] second-highest 24-hour concentration ($\mu g/m^3$)	60.4	27.1	--
National annual average concentration ($\mu g/m^3$)	25.4	20.6	20.1
State annual average concentration ($\mu g/m^3$)[e]	26.4	--	--
Number of days standard exceeded[a]			
NAAQS 24-hour (>150 $\mu g/m^3$)[f]	0	0	0
CAAQS 24-hour (>50 $\mu g/m^3$)[f]	24.4	0	0

Notes:
CAAQS = California ambient air quality standards. NAAQS = national ambient air quality standards.
NA = insufficient data available to determine the value.
[a] An exceedance is not necessarily a violation.
[b] Measurements usually are collected every 6 days.
[c] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.
[d] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California-approved samplers.
[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.
Sources: California Air Resources Board 2005a; U.S. Environmental Protection Agency 2005.

As indicated in Table 3-4, the Jefferson Avenue monitoring station has experienced three violations of the state 1-hour ozone standard; 24.4 violations of the state 24-hour PM10 standard; and no violations of the federal and state CO standard, federal 1-hour ozone standard, federal 8-hour ozone standard, and federal PM10 standard during the last 3 years for which complete data are available. PM2.5 is not monitored in Napa County.

If monitored pollutant concentrations meet state or federal standards over a designated period of time, the area is classified as being in attainment for that pollutant. If monitored pollutant concentrations violate the standards, the area is considered a nonattainment area for that pollutant. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated unclassified.

The EPA has classified Napa County as a nonattainment (other) "not classified/moderate" area under 23 USC Section 104(b)(2), with a 2006 attainment deadline, for the 1-hour ozone standard. For the 8-hour ozone standard, the EPA has classified the County as a marginal nonattainment area. For the CO standard, the study area lies in the urbanized areas described in the Technical Support document from 3/29/85, 50 CFR 12540, and is classified as a moderate (≤ 12.7 ppm) maintenance area, while the rest of the County is classified as an unclassified/attainment area. The EPA has classified the County as an unclassified/attainment area for the PM10 and PM2.5 standards. The ARB has classified the County as a serious nonattainment area for the 1-hour ozone standard. For the CO standard, the ARB has classified the County as an attainment area. The ARB has classified the County as a nonattainment area for the PM10 and PM2.5 standards. The County's attainment status for each of these pollutants relative to the NAAQS and CAAQS is summarized in Table 3-5.

Table 3-5. 2005 Napa County Attainment Status for State and Federal Standards

Pollutant	Federal	State
1-hour O_3	Nonattainment (other) "not classified/moderate" area under 23 USC Section 104(b)(2), with a 2006 attainment deadline	Serious nonattainment
8-hour O_3	Marginal nonattainment	NA[a]
CO	Moderate (≤ 12.7 ppm) maintenance area for the Urbanized Areas (3/29/85, 50 CFR 12540), unclassified/attainment area for rest of the County	Attainment
PM10	Unclassified/attainment	Nonattainment
PM2.5	Unclassified/attainment	Nonattainment

Note:

[a] The Air Resources Board approved the 8-hour ozone standard on April 28, 2005. It is expected to become effective in early 2006.

SENSITIVE RECEPTORS/LAND USES

For the purposes of this climate and air quality analysis, sensitive receptors/land uses are defined as locations where people reside or where members of the population that are particularly sensitive to the effects of air pollutants—such as children, the elderly and people with illnesses—are located. Typical sensitive receptors include residents, schoolchildren, hospital patients, and the elderly.

The following specific areas are considered sensitive receptors/land uses.

- Residences.
- Hospitals or healthcare facilities, and assisted living facilities.
- Parks and wildlife areas.
- Schools.

Sensitive receptors have been identified in the County based on consultation with County staff and a review of web resources. The locations of sensitive receptor areas in the County are discussed in the following sections.

RESIDENCES

Napa County is generally rural, with concentrated populations of residences located primarily within more urbanized cities and towns. These cities and towns are indicated in Map 3-3. Maps 3-4 and 3-5 show the sensitive land uses within each of the cities and towns, as follows.

- Map 3-4: Angwin, Calistoga, Deer Park, St. Helena.
- Map 3-6: American Canyon, Napa, Yountville.

HOSPITALS, HEALTHCARE FACILITIES, AND ASSISTED LIVING FACILITIES

Hospitals, healthcare facilities, and assisted living facilities within the County are identified in Appendix Air-A. The locations of these facilities are shown in Maps 3-3 through 3-5.

Schools, residences, hospitals, healthcare facilities, assisted living facilities, parks, and wildlife areas are sensitive receptors.

PARKS, WILDLIFE AREAS, AND RECREATION AREAS

Public parks, wildlife areas, and other recreation areas, including campgrounds and picnic areas within the County, are identified in Appendix Air-B. The locations of these areas are shown in Maps 3-3 through 3-5.

SCHOOLS

Public and private schools within the County are identified in Appendix Air-C. The locations of these facilities are shown in Maps 3-3 through 3-5.

EXISTING AIR QUALITY INVENTORY

CRITERIA POLLUTANTS

Napa County is home to many industries, processes, and actions that generate emissions of criteria pollutants. The ARB compiles an emissions inventory for all sources of emissions within the County. This inventory is used by the BAAQMD and ARB for regional air quality planning purposes and is the basis for the region's air quality plans. The inventory includes such sources as stationary (e.g., landfills, electric utilities, mineral processes); area-wide (e.g., farming operations, construction/demolition activities, residential fuel combustion); and mobile sources (e.g., automobiles, aircraft, off-road equipment). Current emissions of criteria pollutants for 2004 are summarized in Table 3-6.

Sources of air pollutants in the County include stationary sources (e.g., landfills, electric utilities, mineral processes), area-wide sources (e.g., farming operations, construction/ demolition activities, residential fuel combustion), and mobile sources (e.g., automobiles, aircraft, off-road equipment).

SULFUR DIOXIDE

Crop-dusting, aerial application of pesticides, is practiced in Napa County. Crop-dusting (generally in the form of sulfur application) occurred on approximately 4,500 acres of vineyards throughout the County in 2005. Because sulfur is relatively non-reactive and the County (and state) is in attainment for sulfates and SO_2, aerial application of sulfur has little effect on regional air quality. It is possible that if crop-dusting occurs during periods of high wind, fugitive deposition/drift can occur downwind. However, application of pesticides according to manufacturer and Material Safety Data Sheet (U.S. Occupational Safety & Health Administration) specifications, which often state the required wind speed for application, helps to generally minimize the potential for crop-dusting to affect air quality.

Table 3-6. 2004 Napa County Air Quality Inventory

		Annual emissions (tons per day)						
Source type	Subcategory	TOG	ROG	CO	NO_X	SO_X	PM10	PM2.5
Stationary sources								
Fuel combustion								
Stationary	Electric utilities	0	0	0.17	0.07	0	0.01	0.01
Stationary	Cogeneration	0.06	0.02	0.08	0.18	0	0.01	0.01
Stationary	Oil and gas production (combustion)	0	0	0	0.01	0	0.00	0.00
Stationary	Manufacturing and industrial	0.02	0.01	0.07	0.06	0	0.01	0.01
Stationary	Food and agricultural processing	0.02	0.01	0	0.12	0	0.01	0.01
Stationary	Service and commercial	0.02	0	0.01	0.03	0.01	0.00	0.00
Stationary	Other (fuel combustion)	0.01	0.01	0.04	0.12	0	0.00	0.00
Total fuel combustion		*0.13*	*0.05*	*0.37*	*0.59*	*0.01*	*0.04*	*0.04*
Waste disposal								
Stationary	Sewage treatment	0.01	0	0	0	0	0.00	0.00
Stationary	Landfills	12.42	0.16	0	0	0	0.00	0.00
Stationary	Incinerators	0	0	0	0	0	0.00	0.00
Stationary	Soil remediation	0	0	0	0	0	0.01	0.01
Stationary	Other (waste disposal)	0	0	0	0	0	0.00	0.00
Total waste disposal		*12.43*	*0.16*	*0.00*	*0.00*	*0.00*	*0.01*	*0.01*
Cleaning and surface coatings								
Stationary	Laundering	0.01	0.01	0	0	0	0.00	0.00
Stationary	Degreasing	0.15	0.06	0	0	0	0.00	0.00
Stationary	Coatings and related process solvents	0.15	0.14	0	0	0	0.00	0.00
Stationary	Printing	0.03	0.03	0	0	0	0.00	0.00
Stationary	Adhesives and sealants	0.15	0.14	0	0	0	0.00	0.00
Stationary	Other (cleaning and surface coatings)	0.01	0.01	0	0	0	0.00	0.00
Total cleaning and surface coatings		*0.50*	*0.39*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
Petroleum production and marketing								
Stationary	Petroleum marketing	0.78	0.32	0	0	0	0.00	0.00
Total petroleum production and marketing		*0.78*	*0.32*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
Industrial processes								
Stationary	Chemical	0.04	0.04	0	0	0	0.08	0.08
Stationary	Food and agriculture	0.33	0.33	0	0	0	0.00	0.00
Stationary	Mineral processes	0	0	0	0	0	0.16	0.10
Stationary	Metal processes	0	0	0	0.01	0	0.00	0.00
Stationary	Other (industrial processes)	0.13	0.09	0	0	0	0.06	0.06
Total industrial processes		*0.50*	*0.46*	*0.00*	*0.01*	*0.00*	*0.30*	*0.24*
Total stationary sources		***14.34***	***1.38***	***0.37***	***0.60***	***0.01***	***0.35***	***0.29***

Table 3-6. Continued

		Annual emissions (tons per day)						
Source type	Subcategory	TOG	ROG	CO	NO_X	SO_X	PM10	PM2.5
Area-wide sources								
Solvent evaporation								
Area-wide	Consumer products	1.11	0.93	0	0	0	0.00	0.00
Area-wide	Architectural coatings and related process solvents	0.46	0.45	0	0	0	0.00	0.00
Area-wide	Pesticides/fertilizers	0.24	0.24	0	0	0	0.00	0.00
Area-wide	Asphalt paving/roofing	0.03	0.02	0	0	0	0.00	0.00
Total solvent evaporation		*1.84*	*1.64*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
Miscellaneous processes								
Area-wide	Residential fuel combustion	0.67	0.29	4.57	0.37	0.02	0.59	0.57
Area-wide	Farming operations	7.62	0.61	0	0	0	0.08	0.02
Area-wide	Construction and demolition	0	0	0	0	0	1.29	0.27
Area-wide	Paved road dust	0	0	0	0	0	1.34	0.23
Area-wide	Unpaved road dust	0	0	0	0	0	0.86	0.18
Area-wide	Fugitive windblown dust	0	0	0	0	0	0.80	0.18
Area-wide	Fires	0	0	0.06	0	0	0.00	0.00
Area-wide	Waste burning and disposal	0.05	0.03	0.53	0.02	0	0.07	0.06
Area-wide	Cooking	0.03	0.02	0	0	0	0.09	0.06
Area-wide	Other (miscellaneous processes)	0	0	0.02	0	0	0.02	0.01
Total miscellaneous processes		*8.37*	*0.95*	*5.18*	*0.39*	*0.02*	*5.14*	*1.58*
Total area-wide sources		***10.21***	***2.59***	***5.18***	***0.39***	***0.02***	***5.14***	***1.58***
Mobile Sources								
On-road motor vehicles								
Mobile	Light duty passenger	1.9	1.76	14.86	1.35	0.01	0.06	0.03
Mobile	Light duty trucks – 1	0.93	0.86	8.28	0.73	0	0.02	0.01
Mobile	Light duty trucks – 2	0.57	0.53	5.17	0.65	0	0.02	0.01
Mobile	Medium duty trucks	0.36	0.33	3.13	0.45	0	0.01	0.01
Mobile	Light heavy duty gas trucks – 1	0.14	0.13	0.88	0.09	0	0.00	0.00
Mobile	Light heavy duty gas trucks – 2	0.03	0.02	0.18	0.03	0	0.00	0.00
Mobile	Medium heavy duty gas trucks	0.25	0.23	1.7	0.11	0	0.00	0.00
Mobile	Heavy heavy duty gas trucks	0.11	0.1	1.34	0.18	0	0.00	0.00
Mobile	Light heavy duty diesel trucks – 1	0.01	0.01	0.02	0.12	0	0.00	0.00
Mobile	Light heavy duty diesel trucks – 2	0.01	0.01	0.02	0.09	0	0.00	0.00
Mobile	Medium heavy duty diesel trucks	0.02	0.02	0.12	0.65	0.01	0.02	0.02
Mobile	Heavy heavy duty diesel trucks	0.1	0.09	0.39	1.93	0.02	0.05	0.04
Mobile	Motorcycles	0.12	0.11	0.83	0.02	0	0.00	0.00
Mobile	Heavy duty diesel urban buses	0.01	0.01	0.04	0.22	0	0.00	0.00
Mobile	Heavy duty gas urban buses	0.05	0.05	0.54	0.06	0	0.00	0.00
Mobile	School buses	0.02	0.02	0.22	0.06	0	0.00	0.00
Mobile	Motor homes	0.03	0.03	0.84	0.08	0	0.00	0.00
Total on-road motor vehicles		*4.66*	*4.31*	*38.56*	*6.82*	*0.04*	*0.18*	*0.12*

Table 18-1. Continued

Source type	Subcategory	Annual emissions (tons per day)						
		TOG	ROG	CO	NO_X	SO_X	PM10	PM2.5
Other mobile sources								
Mobile	Aircraft	0.06	0.05	1.77	0.01	0	0.00	0.00
Mobile	Recreational boats	1.72	1.59	10.26	0.46	0.01	0.12	0.09
Mobile	Off-road recreational vehicles	0.01	0.01	0.13	0	0	0.00	0.00
Mobile	Off-road equipment	0.85	0.76	6.99	1.89	0	0.14	0.13
Mobile	Farm equipment	0.23	0.2	1.41	1.41	0.01	0.09	0.09
Mobile	Fuel storage and handling	0.18	0.18	0	0	0	0.00	0.00
Total other mobile sources		*3.05*	*2.79*	*20.56*	*3.77*	*0.02*	*0.35*	*0.31*
Total mobile sources		***7.71***	***7.10***	***59.12***	***10.59***	***0.06***	***0.53***	***0.43***
Natural sources								
Natural sources	Biogenic sources	27.35	26.44	0	0	0	0	0
Natural sources	Wildfires	4.07	0.59	37.02	1.22	0.38	3.8	3.23
Total natural sources		31.42	27.03	37.02	1.22	0.38	3.80	3.23
Napa county total		***63.68***	***38.10***	***101.69***	***12.80***	***0.47***	***9.82***	***5.53***

Notes:

TOG = Total organic gases
ROG = Reactive organic gases
CO = Carbon monoxide
NO_X = Oxides of Nitrogen
SO_X = Oxides of Sulfur
PM = Total particulate matter
PM10 = Particulate matter 2.5 microns or less in diameter
PM2.5 = Particulate matter 2.5 microns or less in diameter

Source: California Air Resources Board 2005b.

MODELED CARBON MONOXIDE CONCENTRATIONS

To identify the potential areas of concentration (hot spots) for carbon monoxide within the County, selected roadway segments were modeled with the CALINE4 model using vehicular emission factors obtained from the EMFAC2002 (version 2.2) emission rate program (Map 3-6). As previously indicated, intersection traffic data was unavailable for this analysis. Consequently, this analysis identifies CO hot spots for selected roadway segments within the County. Table 3-7 summarizes the results of the CO hot spot modeling, and indicates that CO levels are well below the state and federal 1- and 8-hour CO standards (Table 3-1).

Table 3-7. Results of Carbon Monoxide Modeling for Roadway Segments in Napa County

	Existing Year	
Receiver	1-hour[a]	8-hour[b]
1	6.7	3.9
2	6.5	3.8
3	5.8	3.4
4	5.1	3.0
5	4.7	2.7
6	4.8	2.8
7	4.5	2.6
8	4.3	2.5
9	4.3	2.5
10	5.5	3.2
11	5.3	3.1
12	4.5	2.6
13	5.0	2.9
14	4.4	2.5
15	4.3	2.5
16	4.2	2.4
17	4.3	2.5
18	4.2	2.4

Notes: Background concentrations of 4.0 ppm and 2.3 ppm were added to the modeling 1-hour and 8-hour results, respectively.

a The federal 1-hour standard is 35 ppm; the state 1-hour standard is 20.0 ppm.

b The federal 8-hour standard is 9 ppm; the state 8-hour standard is 9.0 ppm.

CONCLUSIONS AND REPORT UPDATE RECOMMENDATIONS

Air quality conditions within the County are such that it is listed as a non-attainment/maintenance area for several pollutants (see Table 3-5 above). Although the County is designated as a non-attainment/maintenance area for several pollutants, monitoring data suggests that few violations of the NAAQS and CAAQS have occurred in the last few years, and air quality has been improving. Due to the relatively rural/agrarian nature of the County, it has relatively few traditional industrial/commercial sources of pollutants, and data from the ARB suggest that transport of some pollutants into the SFBAAB from neighboring air basins can adversely affect air quality within the County. Further, the bowl-shaped valley may also help to trap pollutants within the County.

Because the County is designated as a non-attainment/maintenance area for several pollutants, air quality monitoring data, the attainment status, and local air quality plans should be reviewed regularly in parallel with general planning processes. The data and conclusions presented in this air quality chapter of the BDR should be updated as needed to effectively represent the County's air quality baseline condition. Such a review and update of the BDR for climate and air quality should be conducted at least every 5 years.

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