

### **4.3 AIR QUALITY**

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### ***Air Quality – Environmental Setting***

This section addresses the current air quality setting in Sonoma County, as well as the federal and State regulations as they apply in the county. Air quality impacts are most closely related to the *Open Space and Resource Conservation* and the *Circulation and Transit* elements of the *Draft GP 2020*.

#### **AIR POLLUTION CLIMATOLOGY**

Sonoma County has complex geography and climates. The coastal mountain ranges from several valleys with varying climate regimes. This section discusses the climatology of the sub-regional air basins within the county: the Cotati / Petaluma Valleys, Sonoma Valley, and Alexander Valley.

#### ***Cotati / Petaluma Valleys***

The Cotati Valley to the north and Petaluma Valley to the south create a wide basin stretching from Santa Rosa to San Pablo Bay. These valleys are bordered on the east by the Sonoma Mountains. To the west is a series of low hills and the Estero Lowlands, a relatively flat area surrounding Estero Americano, which is the southern boundary of the county at that point. The region from the Estero Lowlands to San Pablo Bay is known as the Petaluma Gap. This low-level gap in the coastal hills is a major source of marine air flow into the county and the northern Bay Area.

Wind patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap, with winds predominantly from the west. As marine air travels through the Petaluma Gap, it creates northward and southward air currents moving into the Cotati and Petaluma Valleys. The southward path continues into San Pablo Bay and through the Carquinez Strait. Because of this pattern, the prevailing wind direction in Santa Rosa is from the southwest while the prevailing wind direction in Petaluma is from the northwest.

The air pollution potential (i.e., the limitation of the atmosphere's ability to transport and dilute pollutants) is low in the Petaluma Valley because of the influence of the Petaluma Gap. Pollution potential is higher in the Cotati Valley, which is less well ventilated and has natural barriers to air flow to the north and east.

#### ***Sonoma Valley***

The Sonoma Valley is a long, narrow valley running north-south between the Sonoma Mountains on the west and the taller Mayacamas Mountains to the east. Sheltered from winds flowing through the Petaluma Gap, the Sonoma Valley winds are lighter than in the western portions of the county and tend to be from the south during the day and from the north during the night.

The air pollution potential of the Sonoma Valley is high. Prevailing wind can transport locally and regionally generated pollutants northward into the narrow valley, which often traps and concentrations the pollutants under stable conditions. The local upslope (southerly) and downslope (northerly) flows set up by the surrounding mountains may also recirculate pollutants.

### **Alexander Valley**

Alexander Valley is a relatively narrow valley aligned northwest to southeast, bound on the west by the coastal mountains and on the east by the Mayacamas Mountains. Although Alexander Valley is part of a different watershed, there is little terrain separating the Alexander Valley from the Cotati Valley to the south. While the Alexander Valley is ventilated by marine air moving up the Russian River valley, it is also influenced by wind flows traveling northward from the heavily-populated Cotati Valley.

The air pollution potential of the Alexander Valley is high. As an interior valley surrounded by high mountains it has frequent light winds and, like all of California, is subject to periods of high atmospheric stability. Although lightly developed with few industries, it is downwind of the Cotati Valley under certain wind conditions and is affected by pollutants transported into the local air basin.

### **AIR POLLUTANTS OF CONCERN IN SONOMA COUNTY**

The State and federal ambient air quality standards cover a wide variety of pollutants. Only a few of these pollutants are problems in Sonoma County, due to either the extent of emissions or the climate of the region. Following is a description of problem pollutants in Sonoma County.

#### **Ozone**

Ground level ozone, often referred to as smog, is not emitted directly, but is formed in the atmosphere through complex chemical reactions between nitrogen oxides (NO<sub>x</sub>) and reactive organic gases (ROG) in the presence of sunlight. The principal sources of NO<sub>x</sub> and ROG, often termed ozone precursors, are combustion processes (e.g., by automobiles and aircraft) and evaporation of solvents, paints, and fuels. Motor vehicles are the single largest source of ozone precursor's emissions in Sonoma County. Exposure to ozone can cause eye irritation, aggravate respiratory diseases, and damage lung tissue, as well as harm vegetation and reduce visibility.

Ozone concentrations in the Bay Area and southern North Coast Air Basin have shown no strong trends over the last ten years. There is considerable year-to-year variation in levels due to the influence of weather.

#### **Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)**

Particulates are solid or liquid particles, including smoke, dust, aerosols, and metallic oxides that are small enough to remain suspended in the air for a long period of time. PM<sub>10</sub> is particulate matter less than ten microns in diameter. PM<sub>2.5</sub> is particulate matter less than 2.5 microns in diameter. There are many sources of particulate matter emissions, including combustion, industrial processes, grading and construction, farming operations, wind blown dust, and motor vehicles. Of the particulate matter emissions associated with motor vehicle use, some are tailpipe and tire wear emissions, but greater quantities are generated by re-suspended road dust. Consequently, improvements in motor vehicle engines and fuels have not reduced particulate matter emissions as significantly as they have reduced emissions of other pollutants.

Wood burning is a significant source of particulate matter, particularly during episodes when levels of particulate concentrations are highest as on a still and cold night. Wood smoke carries other pollutants, including carbon monoxide, nitrogen dioxide, and volatile organic compounds that include dioxin, benzene, and formaldehyde.

Health effects of particulate matter vary depending on a number of factors, including the type and size of the particle. Research has shown a correlation between highly inhalable particulate matter (PM<sub>10</sub>) concentrations and increased mortality rates. Elevated levels can also aggravate chronic respiratory illness such as bronchitis and asthma. Fine particulate matter (PM<sub>2.5</sub>) is a concern because it can bypass the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The largest emission sources for PM<sub>10</sub> consist of construction and farming operations, entrained road dust, and wind blown dust. The major sources of PM<sub>2.5</sub> are combustion of fuels and smoke. Both PM<sub>10</sub> and PM<sub>2.5</sub> are also created as secondary pollutants in the atmosphere through chemical and photochemical processes.

Particulate matter concentrations in the Bay Area and southern North Coast Air Basin have shown no strong overall trends over the last ten years. While many stationary sources of particulate matter such as factories and mills have either closed or been controlled, area sources such as vehicle traffic and residential wood-burning have been increasing, off-setting the reductions in the stationary emissions.

### ***Diesel Exhaust***

In 1998, after a ten year scientific assessment process, the Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). The state of California has begun a program of identifying and reducing risks associated with particulate matter emissions from diesel-fueled vehicles. The program consists of new regulatory standards for all new on-road, off-road and stationary diesel-fueled engines and vehicles, new retrofit requirements for existing on-road, off-road and stationary diesel-fueled engines and vehicles, and new diesel fuel regulations to reduce the sulfur content of diesel fuel as required by advanced diesel emission control systems.

The need to separate residential uses from sources of diesel can be in conflict with the need to locate housing near bus service. The design, layout and orientation of high-density housing needs to minimize exposure of residents to diesel exhaust. This apparent conflict is likely to be reduced in the future as bus systems switch to cleaner diesels or alternatively fueled vehicles.

Diesel particulate is a relatively inert pollutant (i.e., is not modified in the atmosphere). It is a localized pollutant in that the highest concentrations are found near the source and concentration decreases with distance from the source. The regulation of diesel exhaust from trucks and buses is achieved at the State and federal levels. At the local level, appropriate policies that would site residences, schools, day care centers and other sensitive receptors away from major sources of diesel exhaust (e.g., truck haul routes, warehouses, and distribution centers) can greatly reduce exposures and health risks. Local transit and school districts are now mandated in California to purchase buses with lower emissions.

### ***Wood Smoke***

Wood smoke has long been identified as a significant source of pollutants in urban and suburban areas. Wood smoke contributes to particulate matter and carbon monoxide concentrations, reduces visibility, and contains numerous Toxic Air Contaminants. The particles are composed of organic vapors, carbon, and minerals that are not properly burned in the early phases of a fire. Present State controls on this source include the adoption of emission standards for wood stoves and fireplace inserts. Within the San Francisco Bay Air Basin some jurisdictions have adopted local woodsmoke ordinances, based on the Bay Area Air Quality Management District (BAAQMD) model wood burning ordinance. The Northern Sonoma County Air Pollution Control District's Regulation IV prohibits the installation of conventional fireplaces in new construction and remodels, and requires

that any wood-burning devices be certified. Wood smoke regulation is likely to increase with the recent adoption of PM<sub>2.5</sub> State and federal standards.

### ***Toxic Air Contaminants***

Toxic air contaminants (TACs) are another group of pollutants of concern. Unlike criteria pollutants, no safe levels of exposure to TACs can be established. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes (e.g., petroleum refining and chrome plating operations), commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust. Public exposure to TACs can result from emissions resulting from normal operations, as well as accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

### ***Other Air Quality Issues***

Other air quality issues of concern in the Sonoma County include nuisance impacts of odors and dust. Objectionable odors may be associated with a variety of pollutants and operations. Common sources of odors include concentrated animal operations, wastewater treatment plants, landfills, composting facilities, and industrial plants. Similarly, nuisance dust may be generated by a variety of sources including mining, agriculture, grading, and construction. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to anger and concern over possible health effects among the public.

Northeastern Sonoma County contains geothermal resources that are a potential source of an odorous substance, hydrogen sulfide. Rule 455 of the rules and regulations of the Northern Sonoma County Air Pollution Control District contain specific limitations on emissions of hydrogen sulfide from geothermal power plants. The adoption of this regulation and the general decline in geothermal production at the Geyser geothermal field has greatly reduced the potential for odor problems from this source.

## ***AMBIENT AIR QUALITY STANDARDS***

The federal and California ambient air quality standards for important pollutants are summarized in **Exhibit 4.3.1**. These standards were developed independently with differing purposes and methods, although both processes attempt to avoid health-related effects. As a result, the federal and State standards differ in some cases. In general, the State standards are more stringent. This is particularly true for ozone and PM<sub>10</sub>.

**Exhibit 4.3-1  
 Federal and State Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>Federal Primary Standard</b>	<b>State Standard</b>
Ozone	1-Hour	0.12 ppm	0.09 ppm
	8-Hour	0.08 ppm	--
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.05 ppm	--
	1-Hour	--	0.25 ppm
Sulfur Dioxide	Annual	0.03 ppm	--
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	--	0.5 ppm
PM <sub>10</sub>	Annual	50 ug/m <sup>3</sup>	20 ug/m <sup>3</sup>
	24-Hour	150 ug/m <sup>3</sup>	50 ug/m <sup>3</sup>
PM <sub>2.5</sub>	Annual	15 ug/m <sup>3</sup>	12 ug/m <sup>3</sup>
	24-Hour	65 ug/m <sup>3</sup>	--
Lead	30-Day Avg.	--	1.5 ug/m <sup>3</sup>
	Month Avg.	1.5 ug/m <sup>3</sup>	--

ppm = parts per pillion  
 ug/m<sup>3</sup> = Micrograms per Cubic Meter

Source: *California Air Quality Standards*, California Air Resources Board, July 9, 2003.

**SONOMA COUNTY EXISTING AIR QUALITY**

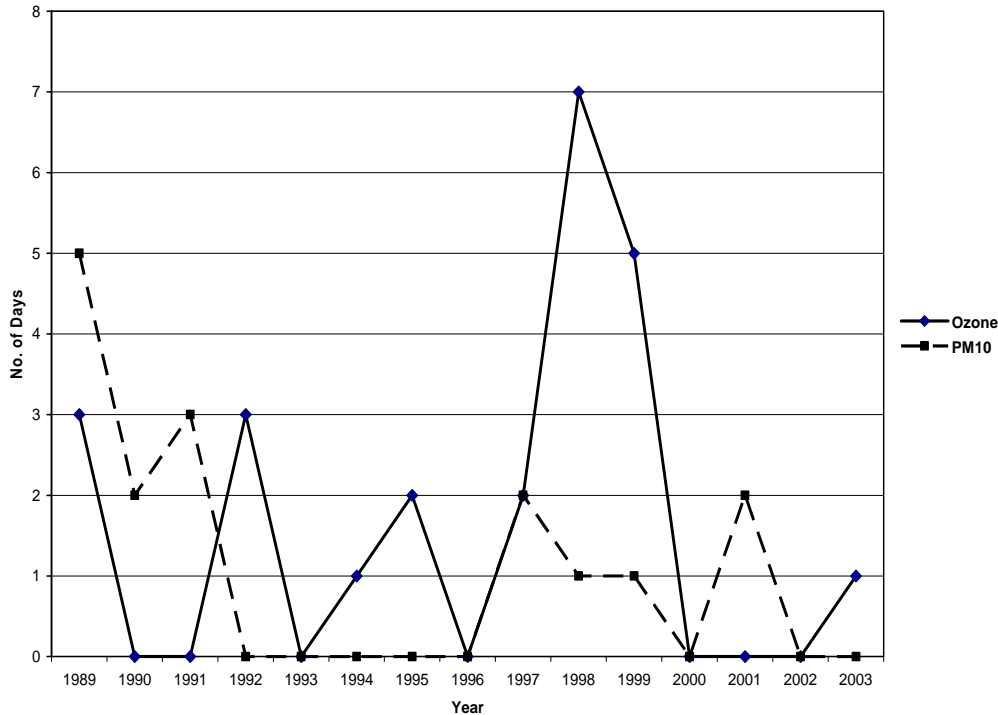
The two air quality monitoring sites in Sonoma County are located in Healdsburg and Santa Rosa. Multiple pollutants are monitored in Santa Rosa while the monitoring site in Healdsburg measures a single pollutant, ozone. **Exhibit 4.3-2** below summarizes violations of air quality standards in Sonoma County for the five-year period 1999-2003. **Exhibit 4.3-3** shows graphically the total number of violations of the most stringent ambient standards for Sonoma County monitoring sites from 1989 to 2001.

**Exhibit 4.3-2**  
**Air Quality Data Summary for Sonoma County, 1999-2003**

<b>Pollutant</b>	<b>Standard</b>	<b>Location</b>	<b>Days Standard Exceeded In:</b>				
			<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Ozone	Federal 1-Hour	Santa Rosa Healdsburg	0 0	0 0	0 0	0 0	0 0
Ozone	State 1-Hour	Santa Rosa Healdsburg	1 4	0 0	0 0	0 0	1 0
Ozone	Federal 8-Hour	Santa Rosa Healdsburg	0 2	0 0	0 0	0 0	0 0
PM10	Federal 24-Hour	Santa Rosa	0	0	0	0	0
PM10	State 24-Hour	Santa Rosa	1	0	2	2	0
PM2.5	Federal 24-Hour	Santa Rosa	0	0	1	0	0
Carbon Monoxide	State / Federal 8-Hour	Santa Rosa	0	0	0	0	0
Nitrogen Dioxide	State 1-Hour	Santa Rosa	0	0	0	0	0

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2004.

**Exhibit 4.3-3**  
**Days Exceeding State Air Quality Standards, 1989 - 2003**



Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2002.

**SENSITIVE RECEPTORS AND POLLUTION SOURCES**

Sensitive receptors are facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the chronically ill) are likely to be located. These land uses include residences, schools, retirement homes, convalescent homes, hospitals, and medical clinics. Such sensitive receptors are located in all areas of the county.

The emissions inventory for Sonoma County shows that the single largest source of ozone precursors is motor vehicle travel. Other major sources are solvent evaporation, industrial sources, and combustion of fuels. Major sources of particulate matter are road dust, residential wood burning, unpaved road travel, construction activities and mineral extraction and processing.

The air districts maintain inventories of sources of toxic air contaminants (TACs). The current inventory identifies numerous dry cleaners and gasoline stations as the most common sources of TACs in the county. Almost all of these sources are located within the jurisdiction of the cities of Santa Rosa, Petaluma, Rohnert Park, Sebastopol, Sonoma and Windsor. Other sources of TACs include mineral processing plants, sewage treatment facilities, and geothermal power plants.

Since identification, quantification, and control of TAC emissions began in the late 1980s, emissions of these pollutants have been steadily declining.

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## **Air Quality – Regulatory Setting**

### **COUNTY AND REGIONAL REGULATIONS**

The county is part of two distinct air basins and air districts (see **Exhibit 4.3-4** Air Quality Management Basins / Districts). The boundary between the air basins / districts runs roughly from the southwest corner of the county at Estero Americano, northeasterly to the northeast corner of Sonoma County at its boundary with Lake and Napa County. The boundary between the two basins / districts crosses US 101 between Windsor and Healdsburg.

The northwestern portions of the county are part of the North Coast Air Basin, consisting of Del Norte, Humboldt, Trinity, Mendocino, and northern Sonoma County. This portion of the county is within the Northern Sonoma County Air Pollution Control District (NSCAPCD). The NSCAPCD is primarily rural and mountainous, containing only two urbanized areas-Healdsburg and Cloverdale). Southern Sonoma County is part of the nine-county San Francisco Bay Air Basin and the Bay Area Air Quality Management District (BAAQMD).

The BAAQMD and NSCAPCD are local air quality agencies responsible for preparing regional air quality plans under the state and federal Clean Air Acts. In addition to planning responsibilities, the local air district has permitting authority over stationary sources of pollutants. Authority over mobile sources of pollutants resides with the California Air Resources Board.

As noted previously, the NSCAPCD has adopted regulations prohibiting installation of conventional fireplaces in new construction and remodels and requiring that wood burning devices meet certain standards. Recently Sonoma County adopted a similar ordinance for the portion of the County within the BAAQMD.

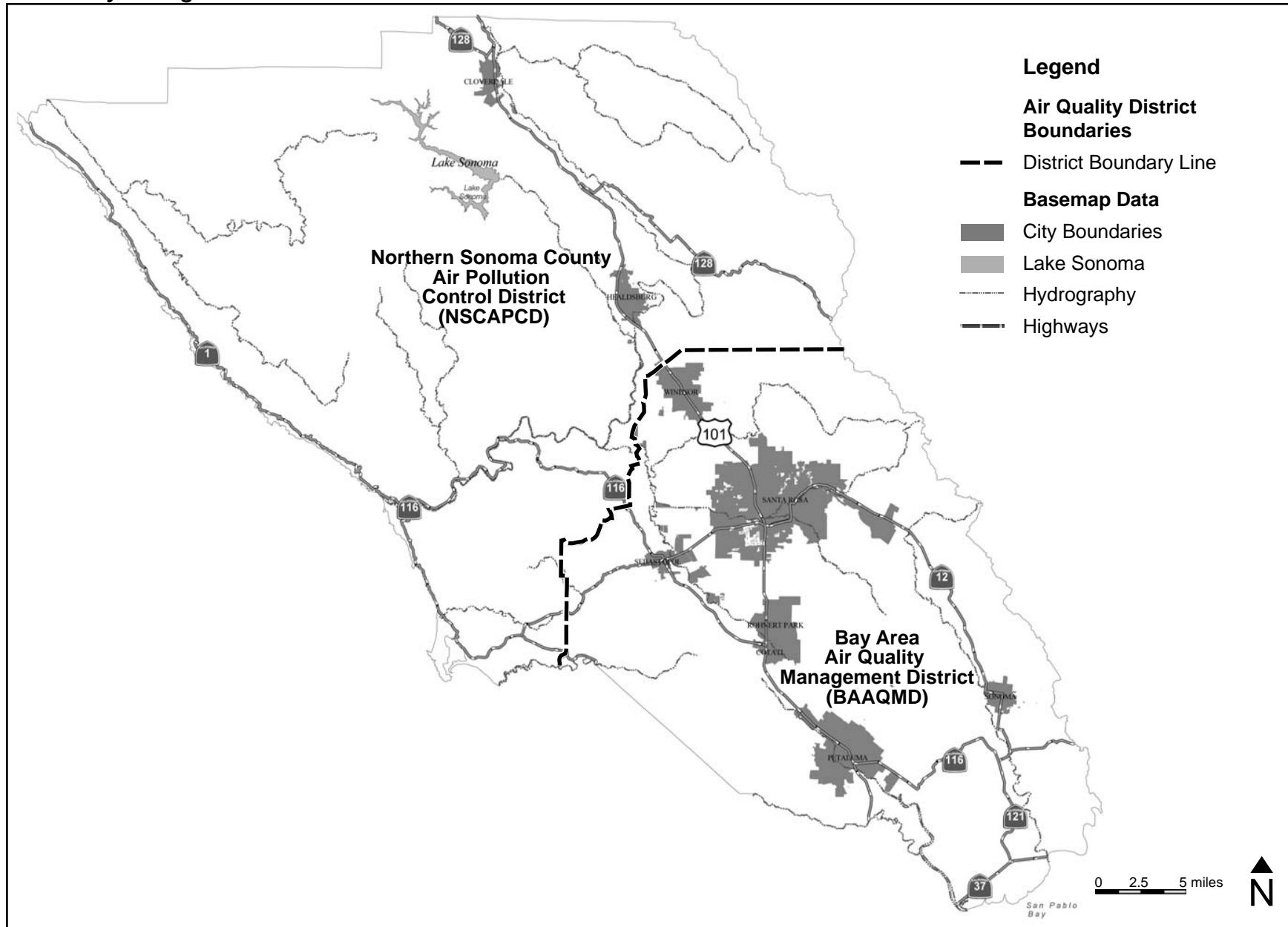
The BAAQMD implemented a new monitoring system that begun in December, 2003. Along with *Spare the Air Days*, usually declared in summer, *Spare the Air Tonight* nights are also declared. Generally most of these nights are declared during the December through February period, when the highest wintertime pollution occurs on cold windless nights.

A *Spare the Air Day* is a day forecast to have ozone levels high enough to exceed federal health-based standards. An advisory is issued the day before this is expected to occur. Area residents are asked to modify their behavior to help minimize pollution, and people who are sensitive to unhealthy air are advised to limit their time outdoors, particularly in the afternoon hours.

### **Smart Growth**

The BAAQMD, together with five other regional agencies, has recently embarked on a program to encourage compact, in-fill development near public transit. The program promotes high-density development with transit orientation, termed *smart growth*, as a means of combating the increasing use of automobiles in the region and thus improve air quality by reducing ozone precursors and particulate matter re-suspension.

**Exhibit 4.3-4**  
**Air Quality Management Basins / Districts**



Source: Sonoma County PRMD, 2005

## **STATE REGULATIONS**

The State has its own air quality standards and air pollution planning programs. In 1988 the California legislature passed the California Clean Air Act, which required air districts to develop air quality plans to meet State standards. In general, the California Clean Air Act required the reduction of air pollutants by five percent or more per year or the implementation of "all feasible measures" to meet the state air quality standards as expeditiously as possible.

Areas that have met these State standards are considered to be *attainment areas*. Similarly, areas that have not met these standards are determined to be *nonattainment areas*. An area that is close to attaining the standard would be given a *nonattainment / transitional* designation.

The San Francisco Bay Area Air Basin was initially determined to be a state nonattainment area for carbon monoxide, ozone, and PM<sub>10</sub> (e.g., solid and liquid particles of dust, soot, aerosols and other matter that are small enough to remain suspended in the air for a long period of time). The Bay Area was reclassified as an attainment area for carbon monoxide, but remains an ozone and PM<sub>10</sub> nonattainment area.

The NSCAPCD portion of the county is nonattainment for the state ozone and PM<sub>10</sub> standard. The ozone designation is nonattainment / transitional, denoting that the area is close to attaining the standard.

## **FEDERAL REGULATIONS**

Air pollution control and planning began in earnest in 1967 with the passage of the Federal Clean Air Act. In 1970 the National Ambient Air Quality Standards (NAAQS) were established for six pollutants. These pollutants are commonly referred to as *criteria pollutants* because criteria documents, which establish the relationship between exposure and effects on human health, have been prepared for each contaminant. The Act required states exceeding the NAAQS to prepare air quality plans showing how the standards were to be met by 1987. The Act was amended in 1977 and in 1990 to extend the deadline for compliance. Failure to submit and implement an acceptable plan meant a state could be denied federal highway funding.

The BAAQMD portion of the county was initially classified as a federal nonattainment area for carbon monoxide and ozone. Ambient levels of carbon monoxide have been steadily declining in the Bay Area since the 1970s, and in 1998 the entire Bay Area was re-designated as an attainment area for this pollutant.

Ozone levels also have been declining since the 1970s, but in a less consistent manner. Based on monitoring data from 1990 to 1992, the Bay Area was re-designated as a federal attainment area for ozone in 1995. However, violations of the ozone standard in 1995 and 1996 caused the U.S. Environmental Protection Agency to re-designate the Bay Area back to nonattainment status, requiring preparation of an updated air quality plan. The Bay Area is considered to have attained all the NAAQS with the exception of the standard for ozone. The NSCAPCD portion of the county is classified as having attained all federal standards.

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## **Air Quality – Significance Criteria**

Appendix G of the *State CEQA Guidelines* provides that a project would have a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The *State CEQA Guidelines* further states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations.

The Northern Sonoma County APCD has not adopted thresholds of significance, but the Bay Area Air Quality Management District has developed thresholds of significance specifically for local plans. Inconsistency with the most recently adopted Clean Air Plan (CAP) is considered a significant impact. According to the BAAQMD, the following criteria must be satisfied for a local plan to be determined to be consistent with the CAP and not have a significant air quality impact: <sup>1</sup>

- The local plan demonstrates reasonable efforts to implement the Transportation Control Measures (TCMs) included in the CAP that identify cities as implementing agencies;
- The local plan must be consistent with the CAP population and Vehicle Miles Traveled (VMT) assumptions. This is demonstrated if the population growth over the planning period will not exceed the values included in the current CAP and the rate of increase in VMT is equal to or less than the rate of increase in population; and
- For local plans to have a less than significant impact with respect to potential odors and / or toxic air contaminants, buffer zones should be established around existing and proposed land uses that would emit these air pollutants.

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<sup>1</sup> Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, April 1996 (Revised December 1999)

**Air Quality – Impacts and Mitigation Measures**

**Impact 4.3-1 Increased Emissions of Ozone Precursors**

Land uses and development consistent with the Draft GP 2020 would result in increased emissions of ozone precursors resulting primarily from vehicles. The increase of emissions within the NSCAPCD would be a less-than-significant impact. However, within the jurisdiction of the BAAQMD, the increased emissions would exceed the District's Clean Air Plan (CAP) thresholds. This would be a significant impact. (S)

To not have a significant impact with respect to ozone, a general plan must be shown to:

- Demonstrate reasonable efforts to implement the Transportation Control Measures (TCMs) included in the CAP that identify cities as implementing agencies; and
- Be consistent with the Clean Air Plan (CAP) population and Vehicle Miles Traveled (VMT) assumptions.

The Draft GP 2020 relationship to each of these criteria is described below separately.

**IMPLEMENTATION OF TRANSPORTATION CONTROL MEASURES**

Exhibit 4.3-5 lists the Draft GP 2020 policies that would support the Clean Air Plan Transportation Control Measures (TCMs). For each TCM a description is provided and a listing of relevant Draft GP 2020 policies is given. The Draft GP 2020 policies would support and implement regional TCMs.

**Exhibit 4.3-5  
 Transportation Control Measures (TCMs) to be Supported by County General Plans**

<b>TCM</b>	<b>Description</b>	<b>Relevant Draft GP 2020 Programs</b>
<b>1. Expand Employee Assistance Program</b>	Provide assistance to regional and local ridesharing organizations.	<p>Policy <b>CT-1e</b>: Support development, implementation and operation of a commuter rail system and contiguous north-south pedestrian and bicycle path along the SMART corridor including the funding necessary to support a multi-modal feeder system.</p> <p>Policy <b>CT-2t</b>: Encourage measures that increase the average occupancy of vehicles including (1) vanpools or carpools, ridesharing programs for employees, preferential parking, parking subsidies for rideshare vehicles, and transportation coordinator positions, (2) preferential parking space and fees for rideshare vehicles, flexibility in parking requirements, HOV lanes on freeways, and residential parking permit restrictions around major traffic generators.</p>

<b>TCM</b>	<b>Description</b>	<b>Relevant Draft GP 2020 Programs</b>
<b>9. Improve Bicycle Access and Facilities</b>	<p>Establish and maintain bicycle advisory committees in all nine Bay Area Counties.</p> <p>Develop comprehensive bicycle plans.</p> <p>Encourage employers and developers to provide bicycle access and facilities.</p> <p>Improve and expand bicycle lane system.</p>	<p>Policies <b>OSRC-18a-18v</b>.</p> <p>Policy <b>CT-1e</b>: Support development, implementation and operation of a commuter rail system and contiguous north-south pedestrian and bicycle path along the SMART corridor including the funding necessary to support a multi-modal feeder system.</p> <p>Policy <b>CT-2z</b>: Implement the Sonoma County Bikeway Plan as described in the Open Space and Resource Conservation Element.</p>
<b>12. Improve Arterial Traffic Management</b>	<p>Continue ongoing local signal timing programs.</p> <p>Study signal preemption for buses on arterials with high volumes of bus traffic.</p> <p>Expand signal timing programs.</p> <p>Improve arterials for bus operations and encourage bicycling.</p>	<p>Policy <b>CT-1c</b>: Work with cities to provide locations for jobs, housing and shopping along the US 101 corridor to reduce the volume of traffic on east/west corridors.</p> <p>Policy <b>CT-2c</b>: On transit routes, design the physical layout and geometrics of arterial and collector highways to be compatible with bus operations.</p>
<b>15. Local Clean Air Plans, Policies and Programs</b>	<p>Incorporate air quality beneficial policies and programs into local planning and development activities, with a particular focus on subdivision, zoning and site design measures that reduce the number and length of single-occupant automobile trips.</p>	<p>Policy <b>CT-1h</b>: Evaluate the traffic impacts of new development with respect to its contribution to housing affordability and maintaining jobs/housing balance.</p> <p>Policy <b>CT-2e</b>: Require major employment centers/businesses to provide facilities and Traffic Demand Management programs that support alternative transportation modes, such as bike and shower facilities, telecommuting, flexible schedules, etc.</p>
<b>17. Conduct Demonstration Projects</b>	<p>Promote demonstration projects to develop new strategies to reduce motor vehicle emissions. Projects include low emission vehicle fleets and LEV refueling infrastructure.</p>	<p>Policy <b>CT-2r</b>: Promote a traffic demand Management program for County Government and schools.</p> <p>Policy <b>CT-2e</b>: Require major employment centers/businesses to provide facilities and Traffic Demand Management programs that support alternative transportation modes, such as bike and shower facilities, telecommuting, flexible schedules, etc.</p>

<b>TCM</b>	<b>Description</b>	<b>Relevant Draft GP 2020 Programs</b>
<b>19. Pedestrian Travel</b>	<p>Review/revise general/specific plan policies to promote development patterns that encourage walking and circulation policies that emphasize pedestrian travel and modify zoning ordinances to include pedestrian-friendly design standards. Include pedestrian improvements in capital improvements programs.</p> <p>Designate a staff person as a Pedestrian Program Manager.</p>	<p>Policy <b>CT-1e</b>: Support development, implementation and operation of a commuter rail system and contiguous north-south pedestrian and bicycle path along the SMART corridor including the funding necessary to support a multi-modal feeder system.</p> <p>Policy <b>CT-2b</b>: Locate transit centers to avoid rerouting by buses, provide adequate off-street parking, and provide convenient pedestrian access from activity centers.</p> <p>Policy <b>CT-2v</b>: Work with school districts and private school developers to provide safe pedestrian access to public and private schools.</p>
<b>20. Promote Traffic Calming</b>	<p>Include traffic calming strategies in the transportation and land use elements of general and specific plans.</p> <p>Include traffic calming strategies in capital improvement programs.</p>	<p>Policy <b>CT-1c</b>: Work with cities to provide locations for jobs, housing and shopping along the US 101 corridor to reduce the volume of traffic on east/west corridors.</p> <p>Policy <b>CT-2c</b>: On transit routes, design the physical layout and geometrics of arterial and collector highways to be compatible with bus operations.</p> <p>Policy <b>CT-3c</b>: Designate the roadway segments for traffic calming improvements on Figures CT1a to 1i. Traffic calming improvements are primarily intended to accommodate local circulation, reduce traffic volumes, and lower speeds to promote the safety of pedestrians and bicycles</p>

Source: Donald Ballanti, Certified Consulting Meteorologist

### **CONSISTENCY WITH CLEAN AIR PLAN ASSUMPTIONS**

The *Draft GP 2020* would be consistent with the latest Association of Bay Area Government (ABAG) population projections that are used in the regional Clean Air Plan within the BAAQMD portion of the County. However, VMT within Sonoma County is expected to increase at a rate greater than population. Total VMT during the AM and PM peak hours in Sonoma County is forecast to increase 41 percent between 2000 and 2020, while population within the unincorporated portions of the county is forecast to increase by 15 percent and population of the county as a whole is forecast to increase by 19 percent during the same period. <sup>2 3</sup>

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<sup>2</sup> VMT increase based on traffic forecast model completed for *Sonoma General Plan 2020 Public Hearing Draft* by Dowling Associates.

The *Draft GP 2020* contains numerous policies and programs in the Land Use, Open Space and Resource Conservation, and Circulation and Transit Elements that, if adopted and implemented, would act to reduce VMT and / or reduce the rate of increase in VMT.

Policies **LU-11a**, **RC-16b**, **CT-1b**, **CT-1d**, **CT-1e**, **CT-2b**, **CT-2e**, **CT-2s**, **CT-2x**, **CT-2y** and **CT-2z** would reduce VMT by encouraging alternatives to the single occupancy vehicle. For example, Policy **LU-11a** encourages alternatives to gas-powered vehicles such as public transit, bicycle and pedestrian routes, and bicycle and pedestrian-friendly development design. Policy **RC-16b** would encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Policy **CT-2d** and **CT-2e** would require major new businesses to include Traffic Demand Management Programs and transit facilities.

Policies **LU-3c**, **LU-11e**, **CT-1c**, **CT-1g**, **CT-1h**, **CT-1i**, and **CT-2t** would attempt to reduce VMT by affecting the number and / or length of vehicle trips. For example, Policy **LU-3c** would avoid urban sprawl by limiting the extension of sewer or water sewer services outside of designated urban services areas pursuant to the policies of the Public Services and Facilities Element. Policy **LU-11e** would encourage the use of compact and mixed-use development that minimizes the need to drive, re-uses existing infill and brownfield sites that have been thoroughly reclaimed and remediated before using open land, and avoids the extension of sprawl.

Policies **LU-1b**, **LU-1f**, **LU-1g**, and **LU-1i** could reduce VMT by requiring ongoing reviews and actions related to growth and development. For example, Policy **LU-1g** would use zoning to regulate the timing of development to assure a better balance between jobs and population.

While these policies and programs would reduce VMT, VMT within Sonoma County would still be expected to increase at a rate greater than that of the population. Within the Bay Area Air Quality Management District portion of the county, this would result in increased emissions of ozone precursors not accounted for in the regional air plan. Such an increase would threaten the eventual attainment of the State and federal ozone standards and / or require additional control measures to be adopted to offset the increased emissions or threaten transportation funds for the region. Within the Northern Sonoma County Air Pollution Control District portion of the county increased emissions of ozone precursors could threaten current attainment status, not only from emissions occurring in the NSCAPCD but from increased transport across the boundary with the BAAQMD. Therefore, this would be a significant impact.

**Mitigation Measure 4.3-1** Add a new policy to the Open Space and Resource Conservation Element as follows:

**Policy OSRC-16h:** Require that development within the Bay Area Air Quality Management District that generates high numbers of vehicle trips, such as shopping centers and business parks, to incorporate air quality mitigations in their designs.

**Significance After Mitigation** The above mitigation measure together with the *Draft GP 2020* policies would represent a comprehensive attempt to limit or reduce VMT through general plan policies and would be supportive of regional efforts to reduce the rate of increase in VMT. These policies, however, would not be able to reduce the rate of VMT increase to below the rate of

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<sup>3</sup> Population increased derived from *Table LU-2 Population Trends and Projections, Sonoma General Plan 2020 Public Hearing Draft*, Sonoma County PRMD.

population increase, partially because the forecasted rate of VMT increase for the county is so high and because *GP 2020* policies can only affect the unincorporated portions of the county. After implementation of the above mitigation measures, countywide VMT would still increase at a rate greater than the rate of population increase. Therefore, this would be a significant unavoidable impact. (SU)

**Responsibility and Monitoring** The Board of Supervisors would be responsible for adopting the above policies as part of the *GP 2020*. The PRMD and air districts would be responsible for monitoring implementation.

**Impact 4.3-2 Increased Particulate Emissions**

*Residential construction consistent with the Draft GP 2020 would result in increased wood-burning. Construction activities consistent with the Draft GP 2020 would result in emissions of dust and other air pollutants. This would be a less-than-significant impact. (LTS)*

New residential construction in the unincorporated portion of Sonoma County would result in an increase in wood burning that could affect local air quality and could result in increased nuisance complaints. Within the Northern Sonoma County APCD portion of the county, the installation of fireplaces and woodstoves is subject to NSCAPCD Regulation IV, which bans open fireplaces and only allows certified wood stoves or other clean alternatives. On February 22, 2005, Sonoma County adopted Ordinance 5546 that imposed similar restrictions within the unincorporated area of the county within the BAAQMD. Wood smoke from new residential construction in the unincorporated area would therefore be a less-than-significant impact.

Construction of individual projects would involve activities that result in air pollutant emissions. Construction activities would temporarily create emissions of dust, fumes, equipment exhaust, and other air contaminants.

Construction activities within the NSCAPCD portion of the county are regulated by the public nuisance provisions of NSCAPCD Rule 400 (General Limitations), the plume opacity limitations contained in NSCAPCD Rule 410 (Visible Emissions), and the dust suppression provisions of NSCAPCD Rule 430 (Fugitive Dust Emissions).

The *BAAQMD CEQA Guidelines* contain construction dust mitigation measures that are applied to individual development proposals through the environmental review process. Standard measures are employed for all construction sites, while enhanced measures are employed at large sites or at sites near sensitive receptors.

Highway construction projects are subject to Caltrans's Special Provisions and Standard Specifications that include requirements to minimize or eliminate dust through the application of water or dust palliatives.

Since construction activities consistent with the *Draft GP 2020* would be subject to the above regulations, this would represent a less-than-significant impact.

**Mitigation Measure 4.3-2** None required.

**Impact 4.3-3 Exposure to Odors / Toxic Air Contaminants**

*Land uses and development consistent with the Draft GP 2020 could emit odors and toxic contaminants that could affect nearby land uses. In addition, occupants of certain land uses proposed near major transportation corridors could be exposed to toxic air contaminants. This would be a significant impact. (S)*

Land uses could be proposed that would be occupied by employees, visitors, or residents that would be exposed to odors or toxic air contaminants that are present in the area from such sources as incinerators, traffic, hazardous waste repositories, and similar uses. Similarly, land uses which would generate odors or toxic air contaminants could be proposed that would result in exposure of people occupying the surrounding area to these problems. This would be a significant impact.

These impacts could be reduced as part of discretionary project review, but the most effective measure is typically the establishment of a buffer zone between the proposed use and the affected neighborhood. According to the *BAAQMD CEQA Guidelines*, for a General Plan to have a less than significant impact with respect to odors and toxic air contaminants, a buffer zone is needed. Such a measure would avoid unnecessarily high exposure of residents to cancer causing agents, irritants, and unpleasant odors.

**Mitigation Measure 4.3-3(a)** Add a new policy to the Open Space and Resource Conservation Element as follows:

**Policy OSRC-16k:** Ensure that any proposed new sources of toxic air contaminants or odors would provide adequate buffers to protect sensitive receptors and comply with existing health standards. Require consideration of odor impacts when evaluating discretionary land uses and development projects near wastewater treatment plants, or treatment plant expansion projects. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another.

**Mitigation Measure 4.3-3(b)** Add a new policy to the Open Space and Resource Conservation Element as follows:

**Policy OSRC-16l:** Require that discretionary projects involving sensitive receptors (facilities or land uses that include members of the population sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses) proposed near the US 101 corridor should include an analysis of mobile source toxic air contaminant health risks. Project review should include an evaluation of the adequacy of the setback from the highway and, if necessary, identify design mitigation measures to reduce health risks to acceptable levels.

**Significance after Mitigation** With adoption and implementation of the policies as outlined in Mitigation Measure 4.3-3(a) and 4.3-3(b), the BAAQMD thresholds of significance for air toxics and odors would be met. Therefore, this impact would be reduced to a less-than-significant level. (LTS)

**Responsibility and Monitoring** The Board of Supervisors would be responsible for adopting the above policies as part of *GP 2020*. The PRMD would be responsible for monitoring implementation.

**Impact 4.3-4 Exposure to Industrial Diesel Truck Emissions**

*Industrial, mineral-extraction, and other land uses and development that generate diesel truck trips could result in exposures of people to diesel particulate (a Toxic Air Contaminant). This would represent a significant impact. (S)*

Land uses and development proposals that generate diesel vehicle trips (e.g., quarries, truck stops, and distribution centers) could cause an unacceptable increase in the cancer risk along roads providing access to the facility.<sup>4</sup> The State of California is implementing a risk management program that would reduce the health risks from diesel particulate over time. The statewide risk management program includes the three following components:

- New regulatory standards for all new on-road diesel vehicles that will result in a 90 percent reduction in particulate emissions from diesel engines;
- New retrofit requirements for existing on-road vehicles where determined to be technically feasible and cost-effective; and
- New diesel fuel regulations to reduce the sulfur content as needed by advanced diesel emission controls.

The projected emission benefit of the State program is a reduction in diesel exhaust particulate of 75 percent by 2010 and 85 percent by 2020.<sup>5</sup> It will be several years before state-mandated controls on trucks result in a substantial reduction in risk because of the relatively long life of diesel vehicles and the high cost of cleaner, newer vehicles. Although the state-mandated programs are likely to eventually reduce diesel truck impacts near industrial facilities to a less-than-significant level, problems with unacceptable risks being associated with facilities generating large amounts of truck traffic will continue for an unknown period of years. This would be a significant impact.

**Mitigation Measure 4.3-4** Add a new policy to the Open Space and Resources Conservation Element as follows:

**Policy OSRC-16m:** Work with the BAAQMD and NSCAPCD to adopt a diesel particulate ordinance regulating land uses that generate diesel vehicle trips. The ordinance should establish trip-based thresholds that trigger mitigation requirements either through source reduction or payment of a mitigation fee to off-set a project's impact in the same geographical area, and provide for periodic review to account for long-term changes in emission rates from diesel trucks.

**Significance After Mitigation** With adoption and implementation of the policy as outlined in Mitigation Measure 4.3-4, this impact would be reduced to a less-than-significant level. **(LTS)**

**Responsibility and Monitoring** The Board of Supervisors would be responsible for adopting the above policy as part of the *GP 2020*. The PRMD, BAAQMD, and NSAPCD would be responsible for monitoring and implementation.

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<sup>4</sup> Don Ballanti communication with Barbara Lee, Air Pollution Control Officer, Northern Sonoma Air Pollution Control District, February 2005.

<sup>5</sup> California Air Resources Board (CARB). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*.

**Impact 4.3-5 Aircraft Emissions**

*Air operations at Sonoma County airports consistent with levels projected by the Draft GP 2020 Air Transportation Element, could result in increased emissions in the region. These emissions are already included in the emission inventory that is the basis for regional air quality plans, and thus are not expected to impede attainment or maintenance of ambient air quality standards. This would be a less-than-significant impact. (LTS)*

Aircraft are mobile sources of air pollution that emit primarily ozone precursors (e.g., ROG and NO<sub>x</sub>), carbon monoxide, and sulfur dioxide. In general, aircraft are a minor source of emissions compared to on-road vehicles and other mobile sources. The California Air Resources Board maintains estimated emission inventories of aircraft emissions by county, utilizing the latest forecasts of aircraft activity and reflecting anticipated changes in emission rates for aircraft as emission control programs come into effect. **Exhibit 4.3-6** shows the CARB estimates of total aircraft emissions for Sonoma County in 2003, 2010 and 2020. Increases are shown for ROG and CO, while NO<sub>x</sub> emissions are expected to remain steady.

**Exhibit 4.3-6** shows increased ROG emissions of 0.01 tons / day (20 pounds / day) between 2003 and 2020. This increase has already been included in the emission inventory that is the basis for regional air quality plans, and thus is not expected to impede attainment or maintenance the ambient air quality standards.

Sonoma County is an attainment area for carbon monoxide. Monitored levels are well below the State and federal ambient standards. As shown in **Exhibit 4.3-6**, the increased carbon monoxide emissions, would not result in any State or federal standards being exceeded. Therefore, this would represent a less-than-significant impact.

**Mitigation Measure 4.3-5** None required.

**Exhibit 4.3-6**

**Forecast Aircraft Emissions for Sonoma County (Tons/day)**

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<b>Year</b>	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>CO</b>
2003	0.06	0.01	1.73
2010	0.06	0.01	1.82
2020	0.07	0.01	2.01

ROG = Reactive Organic Gases  
 NO<sub>x</sub> = Nitrogen Oxides  
 CO = Carbon Monoxide

Source: California Air Resources Board, Forecasted Annual Average Emissions, Sonoma County, 2004.