

2. Introduction

2.1. Purpose

The purpose of these guidelines is to provide a means to identify development projects that may have a significant adverse effect on air quality. This document also provides mitigation measures developers can use to reduce the air quality impacts of their projects. Identification of significant air quality impacts and mitigation in the initial stages of the development process will allow time for design changes for air quality mitigation. The intent of this document is fulfilled if the air quality impact of a conceptual project design is quickly estimated, and mitigation measures are incorporated into the project, prior to formal application submittal.

The California Environmental Quality Act (CEQA) requires that public agencies (e.g. local, county, regional, and state government) consider and disclose the environmental effects of their decisions to the public and governmental decision makers. Further, CEQA mandates that agencies implement feasible mitigation measures or alternatives that would mitigate significant effects on the environment. The District may act as a Lead Agency, a Responsible Agency, or a Reviewing Agency under CEQA.

2.2. District's Role in CEQA

Lead Agency

A Lead Agency is the public agency with the principal responsibility for carrying out or approving a project subject to CEQA. In general, the local government agency with jurisdiction over land use (e.g. a city or county) is the preferred Lead Agency for land development projects. The District will undertake the Lead Agency role if a project requires a District operating permit and no other agency has prepared (or is preparing) a CEQA document for the project. In addition, the District serves as a Lead Agency for its own projects (e.g. adoption of rules or attainment plans).

Responsible Agency

A Responsible Agency is a public agency, other than the Lead Agency, that has responsibility for carrying out or approving a project. The District is a Responsible Agency for projects or portions of a project that require a District operating permit, or any other approval by the District. The Responsible Agency may only consider those aspects of the project that are within the agency's area of expertise or which are required to be carried out or approved by the agency.

As a Responsible Agency, the District may help the Lead Agency identify applicable District rules, provide guidance and assistance on applicable air quality analysis methodologies, and help address other air quality related issues. The District will also submit comments to the Lead Agency through the intergovernmental review process on the adequacy of the Lead Agency's air quality analysis. As part of the review, the District may recommend mitigation measures to reduce or eliminate impacts.

When conducting its review, the District will review the air quality section of the environmental document and other sections that address areas that may contribute to air quality impacts (e.g. traffic and circulation). At the conclusion of the District's review, the District will submit comments to the Lead Agency that identify deficiencies in the air quality analysis, suggest approaches to correct the deficiencies, and recommend additional feasible mitigation measures, where appropriate.

Commenting or Reviewing Agency

An agency that is neither a Lead Agency nor Responsible Agency may be an agency with "jurisdiction by law" over a particular natural resource. This type of agency may be called a Commenting or Reviewing Agency. The District has a program to review air quality analyses in environmental documents submitted to it under CEQA Guidelines Section 15086. As such, the District routinely reviews and provides comments on projects through the intergovernmental review process but for which the agency has no discretionary permit authority and, therefore, is neither a Lead Agency nor Responsible Agency.

The environmental review process conducted by the District as a Reviewing Agency includes, but is not limited to:

- Assessment for project conformance with local, state, and federal rules and regulations;
- The accuracy of the air quality setting data;
- Appropriateness of modeling assumptions, if applicable;
- Whether air quality impacts are adequately described;
- The extent to which recommended mitigation measures are incorporated into the project to reduce impacts;
- Assessment for potential emissions of toxic or hazardous air pollutants; and
- Whether the District agrees with the overall conclusions regarding impacts on air quality.

2.3. Projects Subject to Air Quality Analysis

The air quality considerations that warrant particular attention during the environmental review process include: consistency with District rules and regulations; land use conflicts and exposure of sensitive receptors to odors, toxics, and criteria pollutants; and land use and design measures to encourage alternatives to the automobile and energy conservation. Lead Agencies and project proponents are encouraged to consult with the District as early as possible on these issues.

The District is responsible for implementing programs and regulations required by the Federal Clean Air Act and the California Clean Air Act, including attaining and maintaining ambient air quality standards. As part of this mandate, the District prepares attainment plans which include measures to reduce air contaminants from indirect sources. In

general, any proposed project which has the potential to emit greater than 25 pounds per day of oxides of nitrogen (NO_x) or Reactive Organic Gases (ROG) or 80 pounds per day of particulate matter less than 10 microns (PM₁₀) should be submitted to the District for review.

2.4. Air Pollutants and Health Impacts

2.4.1. Ozone

Ozone, an important ingredient of smog, is a highly reactive and unstable gas capable of damaging the linings of the respiratory tract. This pollutant forms in the atmosphere through complex reactions between chemicals directly emitted from vehicles, industrial plants, and many other sources. Key pollutants involved in ozone formation are reactive organic gases (ROG) and nitrogen oxide gases (NO_x), which are known as ozone precursors.

Exposure to levels of ozone above the current ambient air quality standards can lead to human health effects such as lung inflammation and tissue damage and impaired lung functioning. Ozone exposure is also associated with symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms. The greatest risk for harmful health effects belongs to outdoor workers, athletes, children and others who spend greater amounts of time outdoors during smoggy periods. Elevated ozone levels can reduce crop and timber yields, as well as damage native plants. Ozone can also damage materials such as rubber, fabrics and plastics.

2.4.2. Particulate Matter

Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as “respirable particulate matter” or “PM₁₀.” Fine particles are 2.5 microns or less in diameter (PM_{2.5}) and can contribute significantly to regional haze and reduction of visibility in California.

Extensive research indicates that exposure to outdoor PM₁₀ and PM_{2.5} levels exceeding current air quality standards is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses. Besides reducing visibility, the acidic portion of PM (nitrates, sulfates) can harm crops, forests, aquatic and other ecosystems.

2.4.3. Other Criteria Pollutants

a. Nitrogen Dioxide

Nitrogen dioxide (NO₂) is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract. This pollutant is also an essential ingredient in the formation of ground-level ozone pollution. NO₂ is one of the nitrogen oxides emitted from high-temperature combustion processes, such as those occurring in trucks, cars and power plants. In the presence of sunlight, complex reactions of nitrogen oxides with ozone and other air pollutants produce the majority of NO₂ in the atmosphere. Indoors, home heaters and gas stoves also produce substantial amounts of NO₂.

Exposure to NO₂ along with other traffic-related pollutants, is associated with respiratory symptoms, episodes of respiratory illness and impaired lung functioning. Studies in animals have reported biochemical, structural, and cellular changes in the lung when exposed to NO₂ above the level of the current state air quality standard. Clinical studies of human subjects suggest that NO₂ exposure to levels near the current standard may worsen the effect of allergens in allergic asthmatics, especially in children.

b. Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas. It results from the incomplete combustion of carbon-containing fuels such as gasoline or wood, and is emitted by a wide variety of combustion sources. Exposure to CO near the levels of the ambient air quality standards can lead to fatigue, headaches, confusion, and dizziness. CO interferes with the blood's ability to carry oxygen. Exposure to CO is especially harmful to those with heart disease, because the heart has to pump harder to get enough oxygen to the body. CO exposure has been associated with aggravation of angina pectoris and other aspects of coronary heart disease, decreased exercise tolerance in people with peripheral vascular disease and lung disease, impairment of central nervous system functions, and possible increased risk to fetuses.

c. Sulfur Dioxide

Sulfur dioxide (SO₂) is a gaseous compound of sulfur and oxygen. SO₂ is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO₂ is also emitted from several industrial processes, such as petroleum refining and metal processing.

d. Sulfates

Sulfates (SO₄²⁻) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and / or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO₂) during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO₂ to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

e. Visibility-Reducing Particles

Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.

f. Hydrogen Sulfide

Hydrogen sulfide (H₂S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.

g. Lead

Lead is a relatively soft and chemically resistant metal. Lead forms compounds with both organic and inorganic substances. As an air pollutant, lead is present in small particles. Sources of lead emissions in California include a variety of industrial activities. Because it was emitted in large amounts from vehicles when leaded gasoline was used, lead is present in many soils (especially urban soils) and can get re-suspended into the air.

h. Vinyl Chloride

Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

2.4.4. Toxics

Toxic Air Contaminants (TACs) are airborne pollutants that may be expected to result in an increase in mortality or serious illness or which may have the potential to cause a hazard to human health. Chapter 6 discusses sources of TACs and health impacts.

2.4.5. Odors

The evaluation of potential odor impacts pertains directly to the following question regarding air quality from the Environmental Checklist Form (Appendix G) of the State CEQA Guidelines (available here: http://ceres.ca.gov/ceqa/guidelines/Appendix_G.html):

III.e. Would the project create objectionable odors affecting a substantial number of people?

Lead Agencies should qualitatively evaluate potential odor impact from two scenarios: the proposed project would locate receptors where they would be affected by an existing odor source, or the proposed project would generate odors that would affect a substantial number of people.

The following are common odor sources: agricultural and food processing facilities, landfills, composting facilities, and wastewater treatment plants. For more information on objectionable odors please see Chapter 7.

2.4.6. Greenhouse Gases

The warming trend in Earth's atmosphere, also known as climate change, is related to the release of greenhouse gases (GHG) into the atmosphere. The GHG's of main concern are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Direct human health impacts from climate change are not well established. Changes to climate may lead to sea level rise, spread of diseases, changes to agricultural production, water supply, and weather patterns. Increases in wildland fires and extreme heat days leading to ozone formation have a direct impact to air quality in the District. Chapter 8 provides more information on GHG emissions.

2.5. Ambient Air Quality Standards and the District's Attainment status

AAQS

The National Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) establish Ambient Air Quality Standards (AAQS) for criteria pollutants to protect public health and welfare. A list of National EPA and CARB AAQS is included as Appendix A.

The District is designated as either attainment or nonattainment for each of the AAQS. If there is not enough information to designate an area, the area is unclassified. Table 2.5-1 lists the District's attainment status as of April 6, 2010. The District's attainment status may change due to improvements in ambient air quality measured at monitoring sites, changes in AAQS (both State and National), or other reasons. The District's current attainment status can be verified by calling the District or by checking the website at <http://www.fraqmd.org/2004%20Area%20Designations.htm>.

Table 2.5-1: Feather River AQMD Attainment Status

| Criteria Pollutant | State Designation | National Designation |
|-------------------------------|---|---|
| 1-Hour Ozone | S. Sutter- Serious Nonattainment; Remainder of District- Nonattainment- Transitional (2) | No standard |
| 8-Hour Ozone | Nonattainment- Transitional (2) | S. Sutter-Serious Nonattainment (1); Elevations over 2,000 feet in Sutter Buttes-Marginal Nonattainment; Remainder of District- Unclassified/Attainment |
| PM ₁₀ | Nonattainment | Unclassified |
| PM _{2.5} | Attainment (3) | Nonattainment (4) |
| Carbon Monoxide | Sutter-Attainment Yuba-Unclassified | Unclassified/Attainment |
| Nitrogen Dioxide | Attainment | Unclassified/Attainment |
| Sulfur Dioxide | Attainment | Unclassified |
| Sulfates | Attainment | |
| Lead | Attainment | |
| Hydrogen Sulfide | Unclassified | |
| Visibility Reducing Particles | Unclassified | |

Designations are as of April 6, 2010.

- (1) The District requested to be bump-up to a Severe Nonattainment classification in February, 2008. The EPA is processing this request.
- (2) The District was designated as Nonattainment-Transitional on March 25, 2010.
- (3) The District was designated as Attainment on March 25, 2010.
- (4) The District was designated as Nonattainment effective January 14, 2010.

Air Quality Plans

Sacramento Federal Nonattainment Area 8-Hour Ozone NAAQS State Implementation Plan

The southern portion of Sutter County (as defined in 40CFR Section 81.305) is part of the Sacramento Federal Nonattainment Area (SFNA). The SFNA is designated as a serious nonattainment area for the National 8-Hour Ozone AAQS. The SFNA submitted a plan to meet the attainment deadline of a severe nonattainment area in 2019. This plan includes regulations and measures that the District shall adopt and implement in order to meet the standard. The plan is available for review on the District's website at: http://www.fraqmd.org/air_quality_plans.htm.

Northern Sacramento Valley Planning Area Attainment Plan for California Ozone AAQS

Nonattainment areas for the California Ozone AAQS are required to submit a plan every three years demonstrating progress made toward achieving the standard. The District partnered with other Northern Sacramento Valley nonattainment air districts in completing the plan. The most recent submittal is the 2006 NSVPA Plan. The District is in the process of revising the plan for 2009.

The NSVPA Attainment Plan includes all of Yuba County and the northern portion of Sutter County not included in the Sacramento Federal Nonattainment Area. It is available on the District's website at: http://www.fraqmd.org/air_quality_plans.htm. The District was designated Nonattainment-Transitional due to improving air quality on March 25, 2010.

SB 656 (Sher) PM₁₀ Reduction Measures

As a nonattainment area for California PM₁₀ AAQS, the District has adopted a schedule of adoption of control measures and programs to reduce emissions of PM₁₀. The schedule was adopted by the District's Board of Directors in 2006 and is available on the District's website at <http://www.fraqmd.org/SB%20656.htm>.

PM_{2.5} NAAQS State Implementation Plan

The National PM_{2.5} AAQS was lowered in 2006 from 60 µg/m³ to 35 µg/m³. Most of Yuba County and all of Sutter County have been designated nonattainment for the 2006 NAAQS. Official designations were published in the Federal Register November 14, 2009, and became effective December 14, 2009. The District has three years to submit a plan to EPA which demonstrates the District shall attain the NAAQS within five years of designation. If the District fails to attain the standard the area risks losing federal highway funding, as well as increased offset ratios.

The District is in the process of developing the attainment plan. Updates and information will be posted on the District website as it becomes available. Beginning one year after

official designation, general conformity and transportation conformity rules shall apply. More information on conformity is provided in Chapter 11.

2.6. Meteorology and Air Quality Monitoring in the District

Monitoring

The CARB maintains a monitoring station in Yuba City that measures ozone, particulate matter, nitrogen dioxide, and meteorological conditions. This monitor is located at ground level and is indicative of the ambient air quality conditions for the majority of residents in Yuba and Sutter Counties. Monitoring data from the Yuba City-Almond Street monitor should be used for all environmental analysis of historical air quality. The District recommends using CARB's Aerometric Data Analysis and Management System (ADAM), available at <http://www.arb.ca.gov/adam/welcome.html> for historical air quality data.

The CARB also maintains a monitoring station in the Sutter Buttes at the top of the South Butte. This monitor is used to track transport ozone and is not indicative of ambient air quality at ground level. The Sutter Buttes has been designated as a separate nonattainment area existing 2,000 feet above the valley floor for 8-Hour ozone NAAQS. Environmental analyses should not include data from the Sutter Buttes station except for an evaluation of transport ozone conditions.

Geography and Meteorology

FRAQMD is part of the Sacramento Valley Air Basin (SVAB). The SVAB includes the counties of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and portions of Placer and Solano. The SVAB is bounded on the north by the Cascade Range, on the south by the San Joaquin Valley Air Basin, on the east by the Sierra Nevada, and on the west by the Coast Range.

Summer conditions are typically characterized by high temperatures and low humidity, with prevailing winds from the south. Summer temperatures average approximately 90°F during the day and 50°F at night.

Winter conditions are characterized by occasional rainstorms interspersed with stagnant and sometimes foggy weather. Winter daytime temperatures average in the low 50s and nighttime temperatures average in the upper 30s. During winter, north winds become more frequent, but winds from the south predominate. Rainfall occurs mainly from late October to early May, averaging 17.2 inches per year, but varies significantly each year.

In addition to prevailing wind patterns that control the rate of dispersion of local pollutant emissions, Yuba and Sutter counties experience two types of inversions that affect the air quality. The first type of inversion layer contributes to photochemical smog problems by confining pollution to a shallow layer near the ground. This occurs in the summer, when sinking air forms a "lid" over the region. The second type of inversion occurs when the air near the ground cools while the air aloft remains warm. These inversions occur during winter

nights and can cause localized air pollution “hot spots” near emission sources because of poor dispersion.