These guidelines are nonbinding recommendations, intended to assist lead agencies with navigating the CEQA process. They may be updated as needed in the future, and any updates will likewise be nonbinding and advisory.

5 PROJECT-LEVEL AIR QUALITY IMPACTS

This chapter presents the Air District's guidance on how to conduct an air quality analysis at the project level. Guidance on plan-level air quality analyses is presented in Chapter 7. As described in Chapter 3, Section 3.1, Framework for Analyzing Impacts under CEQA, the air quality analysis should determine if a project will result in a significant adverse impact on the environment, either individually or cumulatively. Lead agencies should first evaluate whether the project will have a significant impact by itself and then consider whether the project may contribute to a significant cumulative impact in conjunction with other past, present, and reasonably foreseeable future projects that also contribute to the impact.[1] To evaluate cumulative impacts, the lead agency must assess (1) whether the overall cumulative impact will be significant and, (2) if the overall impact is significant, whether the incremental contribution of the individual project carries a considerable contribution to the cumulative impact.

The first four sections of this chapter are organized based on the CEQA Guidelines Appendix G Environmental Checklist questions for air quality. The final section of this chapter discusses the analysis of cumulative impacts.

[1] A cumulative impact is the change in the environment that results from the incremental impact of the project under review in conjunction with other past, present, and reasonably foreseeable probable future projects (CEQA Guidelines Section 15355).

CEQA Guidelines Appendix G Environmental Checklist Questions: III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

b) 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?

c) Expose sensitive receptors to substantial pollutant concentrations?

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

5.1 CONSISTENCY WITH AIR QUALITY PLANS

Question a): Would the project conflict with or obstruct implementation of the applicable air quality plan?

5.1.1 Overview of Air Quality Plans and Policies

Air quality plans (AQPs) include clean air plans prepared under the California Clean Air Act, state implementation plans prepared under the federal Clean Air Act, and community emission reduction plans (CERPs) adopted by the Air District per AB 617. As of June 2022, the Air District's most current air quality plans are the 2017 Clean Air Plan: Spare the Air, Cool the Climate and Owning Our Air: The West Oakland Community Action Plan. Other CERPs are under development in the Bay Area, and lead agencies and other interested parties should check with the Air District about the current activities of the AB 617 program and its partners. In addition, lead agencies should consider including a discussion of other local or regional adopted plans that include air quality policies.

5.1.2 Impact Analysis

The analysis should include a discussion of the project's consistency with each applicable AQP. To evaluate whether a project is consistent with an AQP, all three of the follow questions should be answered in the affirmative with substantial evidence provided in support of the answer:

- For each applicable AQP, does the project support the primary goals? The analysis should identify the primary goals of the AQP related to reducing regional air pollutants, local exposure to air pollutants, and greenhouse gas (GHG) emissions, and discuss how the project would support them.

- **For each applicable AQP, does the project include all applicable control measures?** Lead agencies should require that all applicable AQP control measures that can be incorporated into the project design or be applied as mitigation be included. If a measure or measures are not incorporated, the lead agency must provide the reasons, supported by substantial evidence. Projects that incorporate all applicable control measures are considered consistent with the AQP.
- **For each applicable AQP, does the project disrupt or hinder implementation of any control measures?** If approval of a project would not disrupt, delay, or otherwise hinder the implementation of any AQP control measure, the project would be considered consistent with the AQP. Examples of projects that may cause disruption or delay of control measures include projects that preclude an extension of a transit line or bike path and projects that propose parking beyond parking requirements.

5.2 CRITERIA AIR POLLUTANTS

Question b): Would the project 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?

5.2.1 Overview of Criteria Air Pollutants

To protect public health and the environment, the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) set the national ambient air quality standards (NAAQS) and the California ambient air quality standards (CAAQS), respectively. These standards are set for six common air pollutants, known as criteria air pollutants: ground-level ozone, carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead. The San Francisco Bay Area Air Basin's (SFBAAB's) current attainment status for each pollutant is shown in Table 5-1. An area is in attainment if it meets the standards and is not contributing to a nearby area's failure to meet the standards, whereas an area is in non-attainment if it does not meet the standards or contributes to a nearby area's failure to meet the standards. An area is considered unclassified if it cannot be designated, based on available information, as meeting or not meeting the standards.

Table 5-1 San Francisco Bay Area Air Basin Designation Status

Pollutant	Averaging Time	California Standard	California Designation Status	National Standard	National Designation Status
Ozone	1-hour	0.09 ppm	N	—	—
	8-hour	0.070 ppm	N	0.070 ppm	N
CO	1-hour	20 ppm	A	35 ppm	U/A
	8-hour	9 ppm	A	9 ppm	U/A
$PM_{2.5}$	24-hour	—	—	35 µg/m^3	N
	Annual	12 µg/m^3	N	12 µg/m^3	U/A
PM_{10}	24-hour	50 µg/m^3	N	150 µg/m^3	U
	Annual	20 µg/m^3	N	—	—

Pollutant	Averaging Time	California Standard	California Designation Status	National Standard	National Designation Status
SO_2	1-hour	0.25 ppm	A	75 ppb	A/U
	24-hour	0.04 ppm	A	—	—
NO_2	Annual	0.030 ppm	A	0.053 ppm	U
	1-hour	0.18 ppm	A	100 ppb	U/A
Lead	3-month rolling average	—	—	0.15 µg/m^3	U/A
	30-day average	1.5 µg/m^3	A	—	—

Notes: µg/m^3 = micrograms per cubic meter; CO = carbon monoxide; NO_2 = nitrogen dioxide; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; SO_2 = sulfur dioxide; ppb = parts per billion; ppm = parts per million; A = Attainment, N = Non-Attainment, U = Unclassified. Updated information regarding designation status can be found at https://www.epa.gov/green-book, updated May 31, 2022.

The Air District provides project-level thresholds of significance for criteria air pollutants for which the SFBAAB is in non-attainment. These are the levels at which the Air District has determined that an individual project's contribution to the cumulative impact (non-attainment) is cumulatively considerable. Although the SFBAAB is in attainment for CO, elevated localized concentrations of CO still warrant consideration in the environmental review process. Occurrences of elevated localized CO concentrations, known as hot spots, are often associated with heavy traffic congestion, which most frequently occurs at signalized intersections of high-volume roadways. Thus, the Air District is providing a threshold of significance for local CO concentrations.

5.2.2 Construction-Related Criteria Air Pollutant Emissions

Construction-related activities are those associated with the building of project or plan components. Construction activities are typically short term or temporary; however, project-generated activities result in the generation of criteria air pollutants and precursors and could represent a significant impact to local and regional communities with respect to air quality. Construction-related exhaust emissions should be modeled using the most current version of the California Emissions Estimator Model (CalEEMod, see Section 5.2.4 Impact Analysis, below, and Appendix D for guidance on using CalEEMod for Bay Area projects). Sources of exhaust emissions could include on-road haul trucks, delivery trucks, worker commute motor vehicles, and off-road heavy-duty equipment. To reduce construction-related exhaust emissions, projects should incorporate all feasible reduction measures.

When calculating construction emissions, lead agencies should calculate average daily emissions for each construction year based on the number of working days in that year. For construction projects that require less than one year to complete, lead agencies should annualize impacts over the scope of actual days that peak impacts would occur rather than over the full year.

Some projects, given their size, may require a phased construction schedule that results in concurrent construction and operational emissions. For these projects, construction-related exhaust emissions should be combined with operational emissions for all phases where construction and operations overlap.

Construction-related activities, such as soil disturbance, grading, and material hauling, can also result in fugitive dust emissions (e.g., $PM_{2.5}$ and PM_{10}). For a project to have a less-than-significant criteria air pollutant impact related to construction-related fugitive dust emissions, it must implement all Air District's basic best management practices (BMPs) listed in Table 5-2. For additional information on these BMPs see Appendix D, Using CalEEMod for Bay Area Projects, Attachment A, Table DA-1.

Table 5-2 Basic Best Management Practices for Construction-Related Fugitive Dust Emissions

BMP ID	Basic Best Management Practice
B-1	All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
B-2	All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
B-3	All visible mud or dirt trackout onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
B-4	All vehicle speeds on unpaved roads shall be limited to 15 mph.
B-5	All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
B-6	All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
B-7	All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
B-8	Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a 6- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
B-9	Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

In addition to the mitigation measures described in Table 5-2, projects are strongly encouraged to implement enhanced best management practices to control fugitive dust emissions. These enhanced measures are especially important when there are schools, residential areas, or other sensitive land uses located near the construction site and are described in Table 5-3. For additional information on these BMPs see Appendix D, Using CalEEMod for Bay Area Projects, Attachment A, Table DA-1.

Table 5-3 Enhanced Best Management Practices for Construction-Related Fugitive Dust Emissions

BMP ID	Enhanced Best Management Practice
E-1	Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities.
E-2	Install wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
E-3	Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas as soon as possible and watered appropriately until vegetation is established.

BMP ID	Enhanced Best Management Practice
E-4	Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
E-5	Minimize the amount of excavated material or waste materials stored at the site.
E-6	Hydroseed or apply non-toxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days.

Finally, projects must implement all applicable permit and regulatory requirements, and lead agencies should review the Air District's Rules & Compliance webpage at https://www.baaqmd.gov/rules-and-compliance/current-rules for a complete list of current rules and their requirements.

For construction projects, requirements may include, but are not limited to, Regulation 6, Rule 1 (General Requirements) and Regulation 6, Rule 6 (Prohibition of Trackout) which require dust generating operations to limit particulate matter (PM) emissions. Rule 6-1 prohibits fugitive emissions on site and Air District enforcement staff are trained to document visible emissions and fugitive dust using either the opacity or the Ringlemann test methods. For construction sites, the Rule does not prescribe mitigation measures, however operators are expected to utilize standard construction management practices to comply with the fugitive dust emissions prohibition. Rule 6-6 prohibits trackout. For construction sites, the Rule does not prescribe mitigation measures, however construction operators are expected to use common operational measures and suppression techniques (i.e., trackout control devices) to minimize trackout.

5.2.3 Operational Criteria Air Pollutant Emissions

After a project is built, operational emissions are anticipated to occur continuously throughout the project's lifetime. Operational emissions should be modeled using the most current version of the California Emissions Estimator Model (CalEEMod, see Section 5.2.4 Impact Analysis, below, and Appendix D for guidance on using CalEEMod for Bay Area projects). When calculating average daily operational emissions, total annual emissions should be divided by 365 to generate an average daily value for land uses that operate most days of the year. For land uses that operate less frequently, such as a school or an entertainment facility (such as an arena), total annual emissions should be divided by the number of days the facility would operate on an annual basis.

Operational emissions include stationary sources, both permitted and non-permitted, and mobile sources, such as vehicles and other equipment that operate on-road and/or off-road. Stationary sources can have a single emission source with one identified emission point, such as a stack at a facility, can be an entire facility with multiple emission point sources, or can be sources such as fireplaces, stoves, space and water heaters, architectural coatings, and consumer products. Major permitted stationary sources typically are associated with industrial processes, such as refineries and power plants. Minor permitted stationary sources typically are associated with smaller land uses, such as gasoline-dispensing stations and dry-cleaning establishments. Examples of other Air District–permitted stationary sources include backup diesel generators, boilers, heaters, flares, and other types of combustion equipment, as well as non-combustion sources, such as materials

handling and coating and printing operations. The Air District is responsible for issuing permits for stationary sources to reduce air pollution and attain and maintain the NAAQS and CAAQS in the SFBAAB.

5.2.4 Impact Analysis

SCREENING

The first step in determining the significance of construction-related and operational criteria air pollutants and precursors is to compare the attributes of the proposed project with the applicable screening criteria (see Chapter 4). This preliminary screening provides a conservative indication of whether construction and operation of the proposed project may result in the generation of criteria air pollutants or precursors that exceed the thresholds of significance listed in Table 3-1. If all criteria air pollutant screening criteria described in Chapter 4 are met, including the project size is at or below the applicable operational screening level size shown in Table 3-1 and operational activities do not include stationary source engines (e.g., backup generators) or industrial sources subject to Air District rules and regulations, the construction and operation of the proposed project would be expected to result in a less-than-significant impact on air quality. If the proposed project does not meet all screening criteria for criteria air pollutants and precursors, then project emissions should be quantified. If the proposed project does not meet all the screening criteria for local CO (see Section 4.2), contact the Air District for assistance with modeling local carbon monoxide impacts.

EMISSIONS QUANTIFICATION

Baseline Emissions

As discussed in State CEQA Guidelines Section 15125, the baseline typically reflects existing environmental conditions at the time of the notice of preparation (NOP) or when environmental analysis begins; however, lead agencies have discretion to select a different baseline so long as the agency "justif[ies] its decision by showing an existing conditions analysis would be misleading or without informational value" *and* the chosen baseline is "a realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely impacts." (*Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*, [2013] 57 Cal.4th 439, 457, 449.) Both analytical elements must be supported by substantial evidence. (*Id.*) Baseline emissions constitute the starting point for the impact analysis, meaning that a project's potential impacts are measured from those baseline levels. An accurate baseline is thus critical to the proper evaluation of a project's potential impacts. For example, for a project that involves a new source of operational emissions, baseline operational emissions are subtracted from the proposed project emissions. Lead agencies should thus disclose the criteria and/or methodology used to determine the baseline and provide any supporting data.

Modeling Emissions

For proposed land use projects and plans, use the current version of the California Emissions Estimator Model (CalEEMod) to quantify construction-related and operational emissions (see Appendix D for guidance on using CalEEMod for Bay Area projects). CalEEMod is a statewide land use emissions model developed by the California Air Pollution Control Officers Association in collaboration with California air districts to quantify potential criteria air pollutant and precursor and greenhouse gas emissions associated with construction and operations from land use projects. To quantify construction emissions users should

model detailed project information, including but not limited to, construction phases, off-road equipment, vehicle trips, vehicle miles traveled (VMT), and architectural coatings.

For operational emissions, users should model detailed project information, including but not limited to, VMT, fleet mix, road dust, energy, wastewater, waste, off-road equipment, stationary sources, and vegetation. If a traffic study was completed for the project, the project-specific VMT should be modeled in CalEEMod. Quantification of mobile sources should also use emissions factors from the most recent version of CARB's Emission Factor model (EMFAC), which can be imported into CalEEMod.

Note that although limited types of stationary sources can be modeled in CalEEMod, lead agencies should consult with the Air District for any stationary source(s) that will require a permit and should calculate these emissions via methods other than CalEEMod. To the extent possible, the Air District recommends that the methodology used to estimate stationary source emissions be consistent with the Air District's Permit Handbook. Newly modified or constructed stationary sources subject to Air District permitting may be required to implement best available control technology (BACT), which may include the installation of emissions control equipment or the implementation of operational practices that would result in the maximum degree of pollution reduction, as assessed on a case-by-case basis or as determined by the Air District's BACT Workbook. Stationary sources may also be required to offset their emissions to be permitted. This may entail shutting down or improving another stationary source at the same facility. Any stationary source emissions remaining after the application of BACT and offsets should be added to the indirect (e.g., mobile source) and area source emissions estimates to arrive at total project emissions.

For backup generators, the Air District recommends that lead agencies include non-testing and non-maintenance (emergency) operations hours in addition to the permitted testing and maintenance hours for purposes of calculating emissions. While emergency operation is unplanned and infrequent, it is foreseeable that a backup generator may have to operate to respond to emergency conditions at some point during its useful life. Inclusion of annual emergency operations hours is consistent with Air District requirements for calculating the Potential to Emit (PTE) for purposes of determining the applicability of permitting regulations under Reg. 2 including the Air District's New Source Review regulations (Reg. 2, Rule 2) and Title V Major Facility Review regulations (Reg. 2, Rule 6). As described in the Air District's Policy "Calculating Potential to Emit for Emergency Backup Power Generators" (BAAQMD 2019), the Air District uses 100 hours to represent a reasonable worst-case assumption of emergency operations hours for a given year.

To determine appropriate emergency operations hours, lead agencies can refer to available information regarding backup generator use, such as the California Public Utilities Commission (CPUC) Emergency Load Reduction Program (CPUC 2021a) or CPUC information on temporary emergency generation use (CPUC 2021b). Additionally, the Air District is developing supplemental guidance to assist lead agencies in selecting appropriate backup generator emergency operations hours.

Significance Determination and Discussion

As detailed in Section 5.2.1 above, a significance determination should be made as to whether a project's individual contribution is cumulatively considerable for the criteria air pollutants listed in Table 5-1. Although the SFBAAB is in attainment for regional CO, a significance determination should be made for a project's local CO contribution.

In determining significance, unmitigated emissions should first be compared with the Air District's thresholds of significance. If the unmitigated emissions exceed the thresholds, review Chapter 8, "Mitigating Air Quality and Climate Impacts," and the resources provided therein and incorporate all feasible mitigation measures for the project. As discussed in Section 5.2.2, the Air District recommends the implementation of all BMPs (Table 5-2) to reduce the impact of construction-related criteria pollutant fugitive dust emissions to a less-than-significant level. In addition, all projects must implement any applicable air toxics control measures (ATCMs). For example, projects that have the potential to disturb asbestos (from soil or building material) must comply with all the requirements of CARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations and Air District Rule 11-2: Asbestos Demolition, Renovation and Manufacturing. If unmitigated emissions exceed the thresholds, review Chapter 8, "Mitigating Air Quality and Climate Impacts," and the resources provided therein and incorporate all feasible mitigation measures into the project.

Only reduction measures included in the proposed project's description or required as mitigation in a CEQA-compliant environmental document can be included when quantifying mitigated emission levels. After quantifying any reductions from the mitigation measures, compare the mitigated emissions to the thresholds of significance. If the mitigated emissions would be below the thresholds, a less-than-significant impact would occur. However, if the mitigated emissions would still exceed the thresholds of significance, the project would have a significant and unavoidable impact.

In addition, all projects must implement any applicable ATCMs and comply with Air District regulations. For example, projects that have the potential to disturb asbestos (from soil or building material) must comply with all the requirements of CARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations and Air District Rule 11-2: Asbestos Demolition, Renovation and Manufacturing.

HEALTH EFFECTS ASSESSMENT FOR CRITERIA AIR POLLUTANTS

On December 24, 2018, the California Supreme Court issued its ruling in *Sierra Club v. County of Fresno* ([2018] 6 Cal.5th 502), herein referred to as the Friant Ranch decision. The Court ruled that the air quality analysis failed to adequately disclose the nature and magnitude of significant, long-term air quality impacts from project-generated emissions "in sufficient detail to enable those who did not participate in its preparation to understand and consider meaningfully the issues the proposed project raises." The Court noted that the air quality analysis did not provide a discussion of the foreseeable effects of project-generated emissions on the likelihood of exceeding the ambient air quality standards, nor did it draw a connection between the project emissions and adverse health consequences or explain why it was not "scientifically possible" to define such a connection. The Court concluded that "because the EIR as written makes it impossible for the public to translate the bare numbers provided into adverse health impacts or to understand why such translation is not possible at this time," the EIR's discussion of air quality impacts was inadequate to inform the public. According to the decision, the EIR needed to "relate the expected adverse air quality impacts to likely health consequences or explain in meaningful detail why it is not feasible to provide such an analysis, so that the public may make informed decisions" regarding the project.

Thus, to comply with the Friant Ranch decision, lead agencies need to sufficiently explain the nature and magnitude of significant impacts identified by criteria air pollutant and precursor air quality analyses such that readers can meaningfully understand them. Moreover, lead agencies must make a reasonable effort

to connect a project's emissions, where significant, to foreseeable health impacts or provide evidence as to why such an analysis is not scientifically possible.

To demonstrate compliance with the Friant Ranch decision, lead agencies should structure the analyses of criteria air pollutant and precursor impacts as follows:

1. Introduce and describe the potential adverse health effects related to exposure to various criteria air pollutants and precursors in exceedance of the NAAQS and CAAQS, both acutely and chronically.
2. Describe the development and use of mass emissions thresholds using substantial evidence provided in the Air District's thresholds justification report.

   Lead agencies must describe the rationale behind the thresholds of significance for evaluating criteria air pollutant and ozone precursor emissions (see Appendix A, Thresholds of Significance Justification). These project-level mass emissions thresholds are developed in consideration of long-term air quality planning in the SFBAAB and are designed to capture excess emissions that would inhibit attainment of the NAAQS and CAAQS for various pollutants. Projects that exceed these mass emissions thresholds, whether before mitigation or following application of mitigation measures, may contribute emissions that would degrade the ambient air quality of the SFBAAB and expose receptors to concentrations of criteria air pollutants found by EPA and CARB to be hazardous to human health. Lead agencies must make a good-faith effort to explain the connection between the thresholds of significance, long-term air quality planning, NAAQS and CAAQS, and the potential for adverse human health impacts to occur from a project's emissions contribution given that neither the NAAQS or CAAQS are not health impact thresholds below which no significant health impacts are expected.
3. Provide a meaningful and understandable narrative of ozone and secondary PM formation.
4. Explain the approach used, including the applicability and limitations of modeling tools, to translate project emissions into health impacts or explain why it was not scientifically feasible to do so.

   Various modeling tools are available to estimate project-level emissions (e.g., CalEEMod). Additionally, EMFAC generates emissions estimates from transportation sources using factors that account for various state and federal regulations that affect gasoline and diesel fuel consumption, as well as the deployment of electric vehicles throughout the state. However, these models do not predict the locations of exceedances of the NAAQS or CAAQS from one project's emissions alone.

   Photochemical grid-based models simulate the chemical interactions and three-dimensional dispersion patterns on a regional, statewide, and national scale. These models are complex and require significant expertise, knowledge, and resources as they build on other third-party models and processing tools that characterize meteorology, emissions, and other environmental conditions, such as land cover, radiative properties, and boundary conditions. Use of these models is typically beyond the resources available for air quality analysis prepared pursuant to CEQA, and even if such an analysis was to be completed consideration would need be given to ensure the results would be meaningful based on modeling and data limitations.

   The Environmental Benefits Mapping and Analysis Program (BenMAP) is an open-source computer program that calculates the number and economic value of air pollution–related death and illnesses. BenMAP relies on national data such as age, health, and economic conditions, to characterize and map

health impacts associated with air pollution exposure. Data applicability should be considered to determine whether the model may be appropriate for an air quality analysis prepared pursuant to CEQA and if such an analysis would provide meaningful results based on modeling and data limitations.

5. If scientifically feasible, tie the project's emissions to potential negative health impacts if emissions would exceed mass emissions thresholds, both before and after implementing mitigation measures.

5.3 LOCAL COMMUNITY RISKS AND HAZARDS

🔨 Question c): Would the project expose sensitive receptors to substantial pollutant concentrations?

5.3.1 Overview of Local Community Risks and Hazards

Despite improvements in regional air quality, air pollution concentrations continue to remain elevated in some Bay Area communities near major air pollution sources, such as freeways, heavily trafficked seaports or large industrial facilities. In addition, there are many smaller, more discrete sources of air pollution, including gas stations and backup diesel generators, that exacerbate conditions in communities with already elevated levels of air pollution. The air quality conditions in these communities are partially the result of past planning decisions related to land use and transportation. Identifying and avoiding future land use conflicts through careful long-range and strategic planning is one step towards protecting the health of existing and future community members.

Certain community members are more susceptible to poor air quality. These individuals, referred to as sensitive receptors, are typically children, the elderly, and those with preexisting serious health problems. Land uses where sensitive receptors are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers and preschools, hospices, dormitories, prisons, nursing homes, hospitals, and residential communities.

The risk and hazards thresholds of significance apply in determining whether a new source of pollution will result in unacceptable risks to the community. In some instances, they may also be applied to determine if there will be unacceptable risks to new receptors of air pollution—i.e., future users of a project, including future residents and workers. See Chapter 3, Section 3.5 Application of Risk and Hazards Thresholds to New Receptors, for a discussion on when it may be appropriate to use the risks and hazards thresholds to evaluate impacts on a projects' future users.

In all cases, when planning new projects local jurisdictions should pay special attention both to the siting of new sensitive receptors and to the siting of new sources of air pollution near existing and future sensitive receptors. Careful planning is particularly appropriate in areas with existing high local levels of air pollution, even though infill housing near jobs, transit and other services is needed to reduce vehicle miles traveled, improve overall air quality, and reduce greenhouse gas emissions. The Air District's Planning Healthy Places guidebook presents best practices to reduce health risks from local air pollution and offers recommendations addressing and minimizing potential local air pollution issues early in the land-use planning and development process.

TOXIC AIR CONTAMINANTS

The Office of Environmental Health Hazard Assessment (OEHHA) is responsible for identifying toxic air contaminants (TACs), which are defined as pollutants that "may cause or contribute to an increase in deaths or in serious illness, or which may pose a present or potential hazard to human health" (Health and Safety Code Section 39655). TACs are emitted into the air from a wide range of sources in the Bay Area, including diesel engines, cars, trucks, industrial processes, and gas stations. Types of TACs include diesel particulates, lead, benzene, formaldehyde, and hexavalent chromium, to name a few. Diesel particulate matter is the most impactful TAC in the Bay Area, accounting for roughly 85 percent of the cancer risk from air toxics in the region. Exposure to TACs can cause serious health effects, including cancer and birth defects. Other adverse health effects can include damage to the immune system, as well as neurological, reproductive (reduced fertility), development, and respiratory problems.

For evaluation purposes, TACs are assessed locally and separated into carcinogens and noncarcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Noncarcinogenic substances differ in that reference exposure levels (RELs) have been developed to determine the level of exposure below which no adverse health impact is believed to occur. OEHHA develops the RELs on a pollutant-by-pollutant basis for use in risk assessments. Acute and chronic exposure to noncarcinogens is expressed as a hazard index, which is the ratio of expected exposure levels to an acceptable REL.

TACs are regulated in California primarily through state and local risk management programs. These programs are designed to eliminate, avoid, or minimize the risk of adverse health effects from exposures to TACs. A chemical becomes a regulated TAC in California based on designation by OEHHA. As part of its jurisdiction under the Air Toxics Hot Spots Program (Health and Safety Code Section 44360[b][2]), OEHHA derives cancer potencies and RELs for individual air contaminants based on the current scientific knowledge that includes consideration of possible differential effects on the health of infants, children, and other sensitive subpopulations, in accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia, Chapter 731, Statutes of 1999, Health and Safety Code Section 39669.5 et seq.). The methodology in this section reflects the approach adopted by OEHHA (OEHHA 2015), which considers age sensitivity factors to account for early life stage exposures. The specific toxicity values of each TAC as identified by OEHHA are listed in the Air District's Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants (BAAQMD 2021).

FINE PARTICULATE MATTER

Particulate Matter (PM) is the most important health risk driver in Bay Area air, both as fine particulate matter ($PM_{2.5}$) and as diesel PM, a toxic air contaminant (BAAQMD 2020). $PM_{2.5}$ is a complex mixture of substances that includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and wood smoke. $PM_{2.5}$ can be emitted directly and also can be formed in the atmosphere through reactions among different pollutants.

Both long-term and short-term exposure to $PM_{2.5}$ can cause a wide range of health effects, and epidemiological studies have established that exposure to $PM_{2.5}$ has serious adverse health impacts because $PM_{2.5}$ can travel deep into lungs and enter the bloodstream. Fine PM originates from a variety of

sources, including fossil fuel combustion, residential wood burning, cooking, wildfires, and dust. Researchers established long ago that exposure to $PM_{2.5}$ has negative effects on the respiratory system, such as triggering asthma attacks, aggravating bronchitis, and diminishing lung function. More recent studies have found that $PM_{2.5}$ can also harm the cardiovascular system and may cause atherosclerosis (hardening of the arteries), ischemic strokes (caused by an obstruction of the blood supply to the brain), and heart attacks. Because of the serious cardiovascular effects of exposure to $PM_{2.5}$, studies have found a clear correlation between $PM_{2.5}$ levels, exposure, and mortality. Studies also indicate that exposure to $PM_{2.5}$ may be related to other negative health effects, including impacts on the brain, such as reduced cognitive function, as well as increased risk of diabetes. Exposure to $PM_{2.5}$ remains the leading public health risk and contributor to premature death from air pollution in the Bay Area.

5.3.2 Impact Analysis

The methods for assessing the potential health impacts from directly emitted TAC and $PM_{2.5}$ emissions is provided in Appendix E, Recommended Methods for Screening and Modeling Local Risks and Hazards. The methods focus on directly emitted TAC and $PM_{2.5}$ and not those formed through secondary reactions in the atmosphere, which require complex photochemical modeling over large-scale, regional areas.

TAC and $PM_{2.5}$ emissions can occur during construction and/or operation of a project. See Appendix D for guidance on quantifying construction and operational emissions using the current version of the California Emissions Estimator Model (CalEEMod) for Bay Area projects. Quantification of construction-related fugitive dust in addition to exhaust emissions to evaluate the project's local risks and hazards impact is at the discretion of the lead agency. The Air District will be developing further guidance and recommendations to support lead agencies in this decision.

While there are no criteria to screen out of the risks and hazards assessment, the Air District recommends a tiered approach where at each successive step, the project's impacts (i.e., annual $PM_{2.5}$ concentrations, cancer risks, and hazards), and the combined cumulative impacts from surrounding sources and the project, are compared to the appropriate thresholds of significance. For the first tier, screening modeling is recommended that requires minimal site-specific data. The first tier uses the screening methodology to estimate the project's impact and then combines the results from screening tools for different source types (e.g., permitted stationary, rail, on-road mobile) to compare against applicable thresholds of significance. If the thresholds are exceeded at the screening level (Tier 1), project sponsors can refine the analysis further by following Tier 2 recommendations by using complex air dispersion models, source-specific release parameters, and area-specific meteorology. An illustration of the analysis process (Figure ES-1) and a detailed description of the approach is provided in Appendix E, Recommended Methods for Screening and Modeling Local Risks and Hazards.

SIGNIFICANCE DETERMINATION AND DISCUSSION

As detailed in Section 5.3 above, the lead agency should make a significance determination as to whether the project exposes sensitive receptors to substantial pollutant concentrations. Chapter 3, Table 3-1 presents the thresholds of significance for project-level and cumulative risks and hazards impacts.

The project-level threshold addresses the potential for an individual project to significantly elevate existing risks or hazards. A project would have a cumulatively considerable impact if it resulted in:

- An excess cancer risk level of more than 10 in a million; or
- A non-cancer hazard index greater than 1.0 (acute or chronic); or
- An incremental increase of greater than 0.3 µg/m3 annual average $PM_{2.5}$.

The cumulative threshold addresses the potential that a project would have a cumulative significant impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius (or greater where appropriate) results in:

- A excess cancer risk level of more than 100 in a million; or
- A non-cancer hazard index greater than 10.0 (chronic); or
- An annual average of $PM_{2.5}$ greater than 0.8 $\mu g/m^3$.

Alternatively, a project that demonstrates compliance with an adopted Qualified Community Risk Reduction Plan may be found to have a less than significant impact, even if the above thresholds are met. Conversely, for project in areas where a Community Risk Reduction Plan has been adopted, inconsistency with the Community Risk Reduction Plan would demonstrate a significant impact.

In determining significance, unmitigated emissions should first be compared with the Air District's thresholds of significance. For projects with a phased construction schedule that result in concurrent construction and operations, construction-related emissions should be combined with operational emissions for all phases where construction and operations overlap, see Appendix E, Section 2.4, Assessing Impacts from Overlapping Activities.

If unmitigated emissions exceed the thresholds, review Chapter 8, "Mitigating Air Quality and Climate Impacts," and the resources provided therein and incorporate all feasible mitigation measures into the project. Only reduction measures included in the proposed project's description or required as mitigation in a CEQA-compliant environmental document can be included when quantifying mitigated emission levels. After quantifying any reductions from the mitigation measures, compare the mitigated emissions to the thresholds of significance. If the mitigated emissions would be below the thresholds, the project would not make a cumulatively considerable contribution, and a less-than-significant impact would occur. However, if the mitigated emissions would still exceed the thresholds of significance, the project would make a cumulatively considerable contribution, and the impact would be significant and unavoidable.

COMMUNITY RISK REDUCTION PLANS

Preparation of a site-specific health risk assessment is unnecessary if a project can demonstrate consistency with the lead agency's community risk reduction plan. Community risk reduction plans are designed to reduce TAC and $PM_{2.5}$ concentrations and exposure for the entire community covered by the plan to acceptable levels as identified by the local jurisdiction. This approach involves local agencies preparing a plan to improve air quality for entire communities with high levels of risk rather than on a project-by-project basis. This approach is supported by CEQA Guidelines Section 15130(a)(3), which

provides that a project's contribution to a cumulative problem can be less than cumulatively considerable "if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact," and by CEQA Guidelines Section 15064(h)(3), which provides that a project's contribution to a cumulative effect is not considerable "if the project will comply with the requirements in a previously approved plan or mitigation program . . . that provides specific requirements that will avoid or substantially lessen the cumulative problem . . . ."

To be used for CEQA purposes, a community risk reduction plan must be adopted by a local jurisdiction in a public process following environmental review and should include, at a minimum, the following elements:

- description of a defined planning area;
- base year and future year emissions inventories of TACs and $PM_{2.5}$;
- risk modeling of current and future risks;
- risk and exposure reduction goals and targets for the community;
- feasible, quantifiable, and verifiable measures to reduce emissions and exposures; and
- procedures for monitoring and updating the emissions inventory, modeling, goals and targets, and reduction measures.

SPECIAL CONSIDERATIONS FOR SITING SCHOOL OR PROJECTS NEAR SCHOOLS

School children are sensitive receptors that are more susceptible to poor air quality. Therefore, school siting warrants particular care. While public schools must meet specific requirements, the Air District strongly recommends that private schools also adhere to the following requirements.

The California Public Resources Code, Division 13, Environmental Quality (Sections 21000 through 21189.57) states that an environmental impact report (EIR) or a negative declaration meeting all requirements in accordance with CEQA Section 21151.8 and State CEQA Guidelines Sections 15186(a) and 15186(c) must be prepared for projects "involving the purchase of a school site or the construction of a new elementary or secondary school." The California Department of Education provides specific standards for school site selection per the California Code of Regulations, Title 5, Sections 14001 through 14012, which also complies with California Health and Safety Code Sections 21372, 22350, 22352, 22358.4, and 22358.5 (see the California Department of Education's Guide to School Site Analysis and Development, CDE 2000).

Additionally, the EPA has developed voluntary guidelines to assist local school districts and community members evaluate environmental factors to make the best possible school siting decisions. The guidelines including recommendations for evaluating the environmental and public health risks and benefits of potential locations as part of the school siting process. The EPA's School Siting Guidelines are available on the EPA's Healthy School Environments website (EPA 2011).

For proposed projects within 1000 feet of a school, the Air District recommends that a student analysis is included in the Health Risk Assessment (see Appendix E, Recommended Methods for Screening and Modeling Local Risks and Hazards). Additionally, for any project located within one-quarter mile of a school that involves the construction or alteration of a facility that might reasonably be anticipated to emit

hazardous air emissions, or the handling of an extremely hazardous substance or mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified in Health and Safety Code Section 25532(j), and that may impose a health or safety hazard to persons who would attend or would be employed at the school, the lead agency must consult with the affected school district or districts regarding the potential impact of the project on the school and notify the affected school district(s) of the project in writing, not less than 30 days before approval or certification of the negative declaration or EIR per State CEQA Guidelines Section 15186(b)(1)(2).

5.4 ODORS

Question d): Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

5.4.1 Overview of Odors

The ability to detect odors varies considerably among the population and can be subjective. People may have different reactions to the same odor. For example, an odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roasting). Reactions to odors can range from psychological to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). An unfamiliar odor is also more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor with recognition occurring only when the strength of the odor changes.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the concentration in the air. When an odor sample is progressively diluted, the odor concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odor reaches a level that is no longer detectable.

5.4.2 Impact Analysis

Odor impacts could occur if the project proposes a new odor source near existing receptors. The presence of an odor impact is dependent on several variables, including:

- nature of the odor source (e.g., wastewater treatment plant, food processing plant),
- frequency of odor generation (e.g., daily, seasonal, activity specific),
- intensity of odor (e.g., concentration),
- distance of odor source to sensitive receptors (e.g., miles),
- wind direction (e.g., upwind or downwind), and
- sensitivity of the receptor.

The following sections describe (1) how to assess odor parameters, (2) how to use odor screening distances, and (3) how to evaluate odor complaint history.

ODOR PARAMETERS

The first step in assessing potential odor impacts is to gather and disclose applicable information regarding the characteristics of the distance between the sensitive receptor(s) and the odor source(s), local meteorological conditions, and the nature of the odor source. Consideration of odor parameters assists in evaluating the potential for odor impacts as a result of the proposed project. Projects should clearly state the following information in odor analyses, which provide the minimum amount of information required to address potential odor impacts:

- type of odor source(s) produced by the project (e.g., wastewater treatment plant, landfill, food manufacturing plant),
- frequency of odor events generated by the project's odor source(s) (e.g., operating hours, seasonal),
- distance and landscape between the project's odor source(s) and the sensitive receptor(s) (e.g., topography, land features), and
- predominant wind direction and speed and whether the sensitive receptor(s) in question are upwind or downwind from the project's odor source(s).

Note that facilities regulated by the California Department of Resources Recycling and Recovery (CalRecycle) (e.g., landfill, composting) are required to have an odor impact minimization plan (OIMP) approved by CalRecycle with procedures that establish fence line odor detection thresholds. The Air District recognizes for CalRecycle-regulated facilities with an adopted OIMP the lead agency has discretion under CEQA to use the odor detection thresholds established by the OIMP as the thresholds of significance. Regardless of the odor threshold of significance used by the lead agency, per BAAQMD Regulation 1-301, facilities operating within the Air District shall not be operated in a matter that causes public nuisances.

ODOR SCREENING DISTANCES

The Air District has developed a list of recommended odor screening distances for specific odor-generating facilities. The distances are presented in Table 5-4. Projects that would involve the operation of an odor source and would be located closer to sensitive receptors than the screening distances also would have a potentially significant impact. Projects that would site a new odor source farther than the applicable screening distance shown in Table 5-4 from an existing receptor may have a sufficient buffer to avoid a potentially significant impact. The odor screening distances in Table 5-4 should not be used in isolation; rather, they are additional information to consider along with the odor parameters and complaint history.

Table 5-4 Odor Screening Distances

Land Use/Type of Operation	Project Screening Distance
Wastewater treatment plant	2 miles
Wastewater pumping facilities	1 mile
Sanitary landfill	2 miles

Land Use/Type of Operation	Project Screening Distance
Transfer station	1 mile
Composting facility	1 mile
Petroleum refinery	2 miles
Asphalt batch plant	2 miles
Chemical manufacturing	2 miles
Fiberglass manufacturing	1 mile
Painting/coating operations	1 mile
Rendering plant	2 miles
Coffee roaster	1 mile
Food processing facility	1 mile
Confined animal facility/feed lot/dairy	1 mile
Green waste and recycling operations	1 mile
Metal smelting plants	2 miles

ODOR COMPLAINT HISTORY

If the proposed project would involve siting a new odor source and there are existing or planned sensitive receptors within the screening distances shown in Table 5-4, lead agencies should submit a Public Records Request to the Air District to obtain odor complaints in the region for facilities similar in size and type of odor produced in the past 3 years. These surrogate odor complaints should be evaluated for their distance from source to receptor, and then compared with the distance from the proposed project to receptors.

SIGNIFICANCE DETERMINATION AND DISCUSSION

Although the Air District considers a substantial number of odor complaints to be more than five confirmed complaints per year averaged over the past 3 years, it is possible that factors such as a small number of existing nearby receptors, predominate wind direction blowing away from the existing receptors, and seasonality of the odor source have prevented any odor complaints from being filed about the existing odor source. For this reason, odor complaints should not be used as an absolute threshold of significance but as evidence to support a significance determination. The lead agency should compare the odor parameters (i.e., distance and wind direction) associated with the odor complaints that have been filed with those of the proposed project. The results of each of the steps above should be clearly disclosed in the CEQA document. Projects should use the collective information to qualitatively evaluate the potential for a significant odor impact. The lead agency should clearly state the reasoning for the significance determination.

5.5 REFERENCES

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