Handbook for Assessing and Mitigating Air Quality Impacts

Adopted

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The Handbook for Assessing and Mitigating Air Quality Impacts is an update to the 1996 Handbook. Additional modifications may occur as legislative, legal, and technical changes dictate. There are a number of references to specific air quality models in the handbook. These were the most current models available at the time this handbook was prepared and are subject to change. The latest approved versions of these models should always be used for air quality analysis.

This advisory document provides Lead Agencies, consultants, and project applicants with procedures for addressing air quality impacts in environmental documents. Questions on content should be addressed to the Planning Division at (530) 757-3650.

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Abbreviations and Acronyms

AAQS – Ambient Air Quality Standards
AB 2588 – Assembly Bill 2588 Air Toxics "Hot Spots" Program
AQAP –Air Quality Attainment Plan
AQMD – Air Quality Management District
ARB – Air Resources Board
ARB Handbook – Air Resources Board Air Quality and Land Use Handbook
ATC – Authority to Construct
BACT – Best Available Control Technologies
CAAQS – California Ambient Air Quality Standards
Caltrans – California Department of Transportation
CCAA – California Clean Air Act
CEQA – California Environmental Quality Act
CO – Carbon Monoxide
Diesel PM – Diesel Particulate Matter
District – Yolo-Solano Air Quality Management District
EIR – Environmental Impact Report
EMFAC – The EMission FACtor model used to calculate emission rates from all motor vehicles
FCAA – Federal Clean Air Act
H&SC – California Health and Safety Code
Handbook - Handbook for Assessing and Mitigating Air Quality Impacts
LOS – Level of Service
MTIP – Metropolitan Transportation Improvement Plan
NAAQS – National Ambient Air Quality Standards
NO_2 – Nitrogen Dioxide
NOP – Notice of Preparation
NOx – Nitrogen Oxides
OPR – Office of Planning and Research
Pb - Lead
PERP – Portable Equipment Registration Program
PM_{10} – Particulate Matter less than 10 micrometer in diameter
PTO – Permit to Operate
ROG – Reactive Organic Gases
SACOG – Sacramento Council of Governments
SIP – State Implementation Plan
SLAMS - State and Local Air Monitoring network
SO_2 – Sulfur Dioxide
SVAB – Sacramento Valley Air Basin
TAC – Toxic Air Contaminants
T-BACT – Toxic Best Available Control Technologies
URBEMIS – URBan EMISsion model used to calculate emissions from land development
USEPA – United States Environmental Protection Agency
VOC – Volatile Organic Compounds

1.0 Introduction to the Handbook and the Yolo-Solano Air Quality Management District

The Yolo-Solano Air Quality Management District (District) has prepared this "Handbook for Assessing and Mitigating Air Quality Impacts" (handbook) as an advisory document to provide Lead Agencies, consultants, and project applicants with procedures for addressing air quality impacts in environmental documents. The handbook contains the following components:

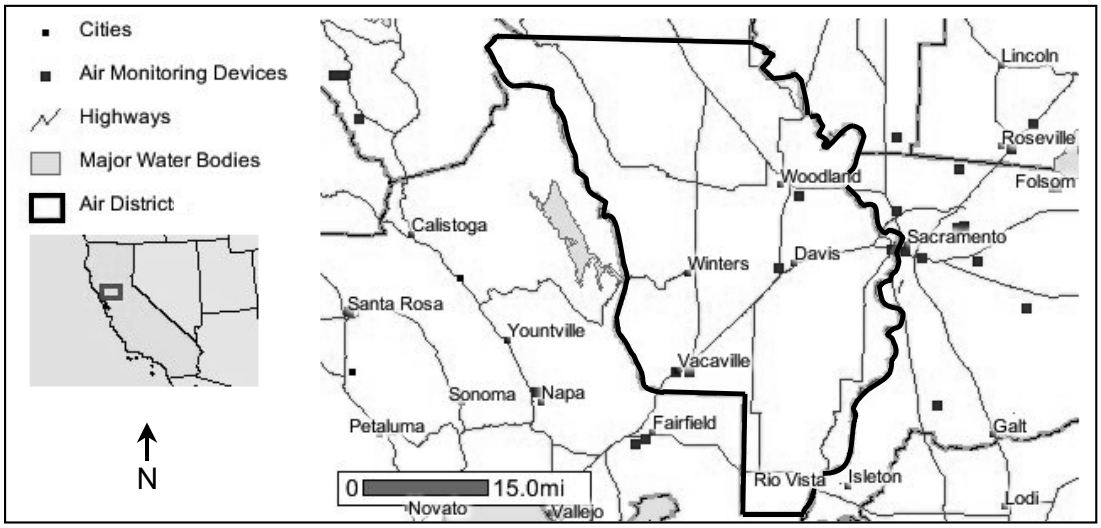
- Preliminary actions Lead Agencies can take to reduce air quality impacts prior to beginning the California Environmental Quality Act (CEQA) process;
- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- Project screening methods, specific procedures and modeling protocols for quantifying and analyzing air quality impacts; and
- Measures that can be implemented to mitigate air quality impacts.

1.1 The District's Environmental Review Program

The District's mission is to protect human health and property from the harmful effects of air pollution in its jurisdiction. As part of the ongoing effort to achieve healthy air, the District reviews and comments on the CEQA documents prepared for discretionary development proposals that could significantly affect the District's air quality. In this way, the District can provide suggestions for reducing emissions of air pollutants and for mitigating potential air quality impacts, and can provide this input relatively early in the planning process.

Figure 1 shows the area over which the District has jurisdiction. As shown in Figure 1, the District's jurisdiction covers Yolo County and the northeast portion of Solano County.

Figure 1. Yolo-Solano Air Quality Management District



(Source ARB CHAPIS website).

1.2 The District's Procedure as a Commenting Agency

CEQA provides project review opportunities at various times during the environmental process. These include opportunities for review prior to the preparation of the environmental document as well as during public review of the completed document. Review prior to preparation is often done in conjunction with the Notice of Preparation (NOP) or scoping meetings. The District requests that it receive copies of all Environmental Impact Reports (EIRs) and Negative Declarations prepared for projects within the District's boundaries.

Shown below is the procedure that the District follows when it receives a request for input as a commenting agency under CEQA:

- Initially, the District staff evaluates all environmental documents it receives to determine if there is a potential for significant adverse effects to air quality. Projects of concern will receive further review.
- The District's policy is to respond to all projects of concern within the review period established by the Lead Agency. If issues arise that cause the District to need additional time for project review, a staff member will notify the Lead Agency and request additional time.
- For typical projects, the District will advise the Lead Agency on the appropriate level of analysis for the project. The District may also recommend possible mitigation measures.
- For large or unusual projects and at the request of the applicant or Lead Agency, the District staff may meet with the project proponents or Lead Agency staff to discuss the impacts and possible mitigation measures.
- The District may attend scoping meetings for EIRs of projects that may have the potential to generate significant air quality impacts.

1.3 Information needed for District's Review

When a Lead Agency follows the guidance in this handbook to prepare an air quality analysis, it should keep in mind that there are several important things that the District looks for when reviewing analyses. The District will generally review Initial Studies/Negative Declarations and Draft EIRs for the following items:

- 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; and
- whether the District agrees with the overall conclusions regarding impacts on air quality.

In order for the District to provide meaningful review, the Lead Agency should also send a complete project description and location, preferably including a map (i.e., site plans, tentative tract or parcel maps). For Negative Declarations, the Lead Agency should include a copy of the Initial Study that documents reasons supporting the Negative Declaration. Where an air quality study was prepared for a project at the Initial Study level, it should be summarized and the results reported in the Initial Study. All assumptions used in the modeling analysis for any

project should be clearly described, and any mitigation measures included in the project to avoid potentially significant effects should be identified.

Draft EIRs prepared for any project in the District should be sent to the District for review and comment. Sometimes, Lead Agencies choose to prepare supplemental air quality studies in addition to the basic analysis in the environmental document. Any additional air quality studies prepared for a project should report all results in the Draft EIR, and should be included as an appendix or as a separate report.

A Lead Agency's response to the District's comments on a Draft EIR may be in the form of the final EIR or may be a separate letter. The District would appreciate that all responses include the date, time, and location of when the Lead Agency proposes to certify the EIR. After the project is approved, the District would appreciate receiving a copy of the Lead Agency's findings for the project.

2.0 When Starting Your Project

To a certain extent, the long-term air quality impact of a project is a function of its design. The layout of streets, the mix of land uses, and the placement of homes and business can all affect overall project emissions. Yet in many instances, the air quality impacts of a project are not considered until well after a project has been designed. At such a late stage, it can be very difficult to make any substantial changes to the project to reduce the project's air quality impact. Thinking about air quality during the initial design phase can help an applicant to implement design features that will reduce that impact. This section provides information that can be used by an applicant during the beginning stages of a project.

2.1 Land Use, Transportation, and Air Quality Link

Mobile source emissions are responsible for a majority of smog-forming emissions in the Sacramento Region. While tailpipe emissions have been decreasing over the last 40 years, these reductions have been offset by increases in total vehicle miles driven. New development projects create new vehicle trips, which in turn add to overall emissions. To help reduce emissions from mobile sources, land use projects can be designed to provide people living and working in a project area with trip options that do not involve driving. By incorporating such strategies in local plans and addressing them during initial discussions with developers, lead agencies increase the likelihood of reducing air pollution resulting from increased dependence on automobiles. Shown below are several examples of land use concepts that can reduce motor vehicle use and emissions.

- Provide pedestrian and bicycle facilities
- Develop concentrated activity centers
- Increase density near transit corridors and transit stations
- Strengthen central business districts
- Encourage vertical mixed-use development
- Develop interconnected street network
- Encourage infill and densification
- Provide strategic parking facilities

2.1.1 Other Resources

Web sites that can provide applicants and lead agencies with additional ideas on land use and design strategies that would benefit air quality can be found in the CEQA section of the District's website.

Also, in 2003 the District, in partnership with regional transportation agencies of Yolo and Solano Counties, prepared a "Best Practices" handbook titled "Transportation and Land Use Toolkit" to provide examples of land use projects and alternative transportation projects that can be implemented to help reach attainment of the air quality standards. This *Transportation and Land Use Toolkit* can be downloaded from the District's website.

2.2 Quantifying Emission Reductions from Project Design

Although it is difficult to quantify reductions from individual strategies applied at specific sites, combinations of strategies implemented community-wide can achieve meaningful reductions in

vehicle use and emissions. Listed below are computer tools that can assist in analyzing indirect and mobile source emission reductions as a result of mitigation through site design. More information on these models can be found by visiting the model's web pages. Links to these web pages can be found in the CEQA section of the District's website.

- URBEMIS
- Place^{3}s
- INDEX

3.0 Thresholds of Significance

CEQA encourages public agencies to adopt thresholds of significance for determining whether projects have significant adverse impacts. The CEQA Guidelines §15382 defines "significant effect on the environment" as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including ... air." This section presents the District's recommended thresholds of significance for air quality, which have been adopted by the District's Governing Board.

3.1 Basis for Thresholds of Significance for Criteria Pollutants

The Air Quality Section of Appendix G of the CEQA Guidelines (Environmental Checklist Form), published by the State Office of Planning and Research (OPR), contains a list of effects that may be considered potentially significant. These are:

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

The District's thresholds of significance are based on this environmental checklist.

Table 1 shows the project-level thresholds of significance as established by the District for particulate matter less than 10 micrometers in diameter (PM_{10}), carbon monoxide (CO), and the precursors to ozone, which are reactive organic gases (ROG) and nitrogen oxides (NOx). The thresholds apply to both construction and operational impacts.

Table 1. Thresholds of Significance for Criteria Pollutants of Concern.

Pollutant	Thresholds of Significance
ROG	10 tons/year
NO_x	10 tons/year
PM_{10}	80 lbs/day
CO	Violation of a state ambient air quality standard for CO

3.2 Additional Thresholds of Significance

Besides setting thresholds for criteria pollutants, the District has adopted several other thresholds for toxics, odors (which also fall under the purview of the District), and cumulative impacts. The District has also set thresholds for certain special types of projects such as general plans and federal projects.

3.2.1 Toxic Air Contaminants (TACs) Threshold

Proposed development projects that have the potential to expose the public to TACs from stationary sources in excess of the following thresholds would be considered to have a significant air quality impact. These thresholds are based on the District's Risk Management Policy.

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) equals to 10 in one million or more.
- Ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index equal to 1 for the MEI or greater.

While the District's Risk Management Policy provides a basis for a threshold for TACs from stationary sources, this policy does not cover TACs from mobile sources. The District has no permitting or other regulatory authority over mobile sources. While the district continues to evaluate a threshold of significance for mobile source TAC, no specific mobile source TAC threshold is proposed at this time.

3.2.2 Cumulative Impact Threshold

An air quality analysis should address a project's cumulative impact on ozone and localized pollutants. Any proposed project that would individually have a significant air quality impact (see above for project level Thresholds of Significance) would also be considered to have a significant cumulative impact. See Appendix B for the basis of this threshold.

CO impacts are cumulatively significant when modeling shows that the combined emissions from the project and other existing and planned projects (i.e., background concentration) will exceed air quality standards. The cumulative impact should be evaluated using the screening criteria mentioned in the next section for the project level thresholds to determine if cumulative development could cause a violation of the California Ambient Air Quality Standards (CAAQS).

3.2.3 Plan Consistency Threshold

In regards to environmental documents prepared for local or regional plans, the State CEQA Guidelines, Section 15125(d), states that an EIR shall discuss "any inconsistencies between a proposed project and applicable general plans and regional plans. Such regional plans include, but are not limited to, the applicable air quality attainment or maintenance plan or State Implementation Plan [SIP]...". General Plans of cities and counties must show consistency with the District's Air Quality Attainment Plan (AQAP) and SIP strategies in order to claim a less than significant impact on air quality. This is because the air quality planning process estimates growth in emissions based on different indicators and emission growth is offset by regional controls on sources of air pollution. General plan amendments, redevelopment plans, specific area plans, annexations of lands and services, and similar planning activities should receive the same scrutiny as general plans with respect to consistency with the AQAP and SIP.

3.2.4 Federal Activities Thresholds

District Rules 10.2 - Transportation Conformity and 10.3 - General Conformity incorporate by reference the Code of Federal Regulations, Title 40, Transportation Conformity and General Conformity Rules. This requires that a federal action must not adversely affect the timely attainment and maintenance of national air quality standards. In other words, Transportation

Conformity requires that federal transportation actions conform to the SIP. The Sacramento Area Council of Governments, through an interagency consultation process, makes transportation conformity determinations when it compares the Metropolitan Transportation Improvement Plan (MTIP) to the motor vehicle emission budgets of the SIP. The MTIP includes, but is not limited to, transportation plans, projects, and programs that receive federal funds. If the estimated emissions from MTIP projects are less than the vehicle emission budgets in the SIP, the Plan is considered to have a less than significant impact.

The General Conformity Rule applies to federal activities not covered by the Transportation Conformity Rule. The Rule covers all "direct" and "indirect" emissions that are a "reasonably foreseeable" result of a federal action. In an area with a SIP (non-attainment), conformity can be demonstrated in one of four ways:

- By showing that the emission increases caused by an action are included in the SIP,
- By demonstrating that the State agrees to include the emission increases in the SIP,
- Through offsets,
- Through mitigation.

In creating de minimis emission levels, U.S. Environmental Protection Agency (USEPA) sought to limit the need to conduct conformity determinations for actions with minimal emission increases. When the total direct and indirect emissions from the project/actions are below the de minimis levels, the project/action would not be subject to a conformity determination. Under the existing regulations, de minimis emission levels are listed for each criteria pollutant. Annual emission rates per calendar year are used. The defined *de minimis* level is 25 tons/year for ozone (VOC or NOx). Federal actions with emissions below this minimum threshold are not obligated to perform a conformity determination.

3.2.5 Offensive Odors Threshold

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the District. The general nuisance rule (H&SC §41700 and District Rule 2.5) is the basis for this threshold. A project may reasonably be expected to have a significant adverse odor impact where it "generates odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property."

4.0 Assessing Air Quality Impacts (Initial Screening)

This section provides methods for screening projects to determine whether a proposed project has the potential to exceed any District threshold of significance. Lead Agencies have wide latitude in deciding the level of detail they will use to analyze and describe air quality impacts. This section will provide lead agencies with an idea of the appropriate level of analysis needed for their project.

4.1 Project Screening

In some cases the Lead Agency may know that an EIR is the appropriate environmental document for a project. In such cases, the Lead Agency may immediately begin preparing an EIR without preparing an Initial Study [CEQA Guidelines, §15060 (d)]. In most cases, (provided that the project does not qualify for statutory exclusion or categorical exemption) however, the Lead Agency will need to prepare an Initial Study to determine whether any of the thresholds of significance could be exceeded.

When considering a project's impact on air quality, the Lead Agency must consider all phases (i.e., construction and operation) and provide evidence to support its conclusions. The Lead Agency is encouraged to use the URBEMIS emissions model to perform quantified, screening-level air quality analyses. URBEMIS estimates indirect source emissions from land use developments based on vehicle trip generation and land use-related area source emissions. It also provides estimates from construction activities. The Lead Agency can also use the District as an additional resource in preparing the air quality analysis of Initial Studies.

4.1.1 Screening for Operational Ozone and PM_{10}

To help identify projects requiring an increased level of analysis, Table 2 presents examples of projects by size and land use type that would likely exceed the District's thresholds of significance for analysis years 2007 and 2010. These analysis years were chosen because project PM_{10} emissions, rather than ROG and NOx, generally trigger significance thresholds after 2010. The values provided were derived using URBEMIS version 8.7 and should not be considered absolute thresholds of project significance. If there is any question about whether a project could exceed any threshold, the Lead Agency should undertake a full air quality analysis. Projects falling considerably (i.e., more than 10%) under these sizes, however, may be safely assumed to need no quantification of ozone precursor emissions; although other factors such as TACs, asbestos, and odors still need to be analyzed. In addition, emissions from construction activities are not accounted for in Table 2. Industrial land use types are not represented in the table because these land use types require more information such as truck fleet and activity data.

Note that even if a project is below the values on the list, it does not relieve the Lead Agency from assessing a project for other potentially significant air quality impacts. Projects containing sensitive receptors such as residential subdivisions, schools, or hospitals, must especially be assessed for exposure to pollutants from existing or planned industrial and commercial development.

Table 2. Project Size That May Exceed District Thresholds for ROG, NOx, and PM_{10}[1,2]

URBEMIS 8.7 Land Use Categories	Project Size	
	Year 2007	Year 2010
Residential (dwelling units)		
Single Family	280	325
Apartments, Low Rise	345	390
Apartments, High Rise	395	445
Condominiums/Townhouse, General	345	390
Retirement Community	430	475
Commercial (square feet)		
General Office Building	870,000	1,100,000
Office Park	250,000	320,000
Government Office Building	55,000	75,000
Government (Civic Center)	140,000	185,000
Medical Office Building	110,000	150,000
Hospital	195,000	255,000
Retail (square feet)		
Free Standing Discount Store[3]	125,000	160,000
Discount Club Store	100,000	135,000
Regional Shopping Center	100,000	130,000
Supermarket[3]	70,000	90,000
Convenience Market (w/ gas pumps)[3]	13,000	16,500
Recreational		
Racquet/Health Club (square feet)	125,000	165,000
City Park (acres)	2,500	3,100
Quality Restaurant	45,000	60,000
Fast Food Restaurant (w/ drive-through)	8,000	11,000
Hotel (rooms)	440	585
Motel (rooms)	640	800
Educational (square feet)		
Day Care Center[3]	110,000	140,000
Elementary School	245,000	310,000
Junior High School	255,000	325,000
High School	295,000	380,000
Place of Worship	440,000	560,000

[1] Thresholds are 10 tons per year for ROG and NOx, and 80 lbs/day for PM_{10}.
[2] URBEMIS 8.7, emissions from area and operation sources with no mitigation selected and with following default edits: rural setting selected, architectural coatings emission factors 0.0049 lbs/sf for residential and 0.0069 lbs/sf for non-residential, 0% open hearth fireplaces and 45% wood stoves.
[3] Pass-by trips option switched on where pass-by and diverted-linked trips dominate the percentage of trips assumed with each land use.

4.1.2 Screening for CO Impacts

A screening approach, originally developed by San Joaquin Valley Unified Air Quality Management District (AQMD), can be used to estimate whether or not a project's traffic impact would cause a potential CO hotspot at any given intersection. If either of the following criteria is

true of any intersection affected by the project traffic, then the project can be said to have the potential to create a violation of the CO standard.

- A traffic study for the project indicates that the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to an unacceptable LOS (typically LOS E or F); or
- A traffic study indicates that the project will substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "Substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

4.1.3 Screening for Land Use Conflicts and Sensitive Receptors

The location of a project in relation to other uses should also be analyzed to determine if there is the potential for localized air quality impacts. Localized air pollution impacts generally occur in one of two ways:

- a (new) source of air pollutants is proposed to be located close to existing receptors. For example, an industrial facility is proposed for a site near a school; or
- a (new) development project with receptors is proposed near an existing source of air pollutants. For example, a hospital is proposed for a site near an industrial facility.

The amount of emissions, the proximity between the emissions source and the nearest receptor, the direction of prevailing winds, and local topography can all influence the severity of a localized impact. All of these factors should be evaluated by the Lead Agency when assessing the potential for an impact. While impacts on sensitive receptors are of particular concern, localized impacts are generally not limited only to sensitive receptors. Thus, any evaluation of potential air quality impacts should consider all members of the nearby population.

While a number of pollutants can produce localized impacts, the most frequent impacts are those related to:

- TACs
- Odors
- Construction Dust

Screening assessments for each of these potential impacts are discussed below.

TACs

In April 2005, Air Resources Board (ARB) published the "Air Quality and Land Use Handbook: A Community Health Perspective" (ARB Handbook) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The ARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. A copy of the guide can

be obtained from the ARB website. A link to this ARB web page can be accessed from the CEQA section of the District's website. The ARB Handbook recommends minimum separations between new sensitive land uses and eight categories of existing sources as shown in Figure 2 below (Table 1-1 in ARB Handbook).

Figure 2. ARB Recommended Minimum Separations

Table 1-1
Recommendations on Siting New Sensitive Land Uses
Such As Residences, Schools, Daycare Centers, Playgrounds, or Medical Facilities*

Source Category	Advisory Recommendations
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.[1]
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro-ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.

[1] Rural area as defined in §50101 of the H&SC, an urban area as defined in §50104.7 of the H&SC

*Notes:

1. These recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

2. Recommendations are based primarily on data showing that the air pollution exposures addressed here (i.e., localized) can be reduced as much as 80% with the recommended separation.
3. The relative risk for these categories varies greatly. To determine the actual risk near a particular facility, a site-specific analysis would be required. Risk from diesel PM will decrease over time as cleaner technology phases in.
4. These recommendations are designed to fill a gap where information about existing facilities may not be readily available and are not designed to substitute for more specific information if it exists. The recommended distances take into account other factors in addition to available health risk data (see individual category descriptions).
5. Site-specific project design improvements may help reduce air pollution exposures and should also be considered when siting new sensitive land uses.
6. This table does not imply that mixed residential and commercial development in general are incompatible. Rather it focuses on known problems like dry cleaners using perchloroethylene that can be addressed with reasonable preventative actions.
7. A summary of the basis for the distance recommendations can be found in Table 1-2.

The ARB Handbook is useful in calling attention to incompatible land uses. However, while the ARB Handbook makes distance recommendations where possible, it has not provided specific thresholds of significance for TACs. Therefore, the following will serve as the basis for comments provided on project reviews to local jurisdictions.

Housing and other facilities accommodating sensitive receptors in new development projects that are located more than the ARB recommended distances from any source category identified in the ARB Handbook (Table 1-1) are not considered to be at elevated risk.

For projects that are located nearer a source than recommended by the ARB Handbook, the District's comments will be based on the following:

Housing and other facilities accommodating sensitive receptors in new development projects located within the ARB recommended distance from the source categories identified in Table 1-1 of the ARB Handbook are considered to be exposed to an elevated risk. Lead Agencies should conduct further analysis to estimate the health risk.

The Lead Agency should consider the recommendations of the ARB Handbook and should avoid placing sensitive receptors in the area immediately adjacent to the source of air toxics. Also, a Lead Agency should examine whether the project would place receptors near any potential TAC sources not listed in the ARB Handbook. An environmental document should include discussion of the potential for project receptors to be exposed to an elevated risk.

Odors

Offensive odors are another source of concern where incompatible land uses are located in proximity to each other. Odor impacts on residential areas and other sensitive receptors warrant close scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. Screening of potential odor impacts should be conducted for the following two situations:

- Projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
- Residential or other sensitive receptor projects or other projects that may attract people locating near existing odor sources.

The list below shows some common types of facilities that are known producers of odors. This list of facilities is not meant to be all-inclusive. However, it will assist Lead Agencies in recognizing the types of facilities where more analysis may be warranted or where greater distance should separate a project from the odor source.

- Wastewater Treatment Facilities
- Chemical Manufacturing
- Sanitary Landfill
- Fiberglass Manufacturing
- Transfer Station
- Painting/Coating Operations (e.g. auto body shops)
- Composting Facility
- Food Processing Facility
- Petroleum Refinery
- Feed Lot/Dairy
- Asphalt Batch Plant
- Rendering Plant

If the project would locate receptors and known odor sources in proximity to each other (up to one mile) a full analysis, as described in Section 5, should be undertaken.

Construction Dust/PM

Most land use projects require some earthmoving during the project's construction phase. Without control, dust emissions from grading, trenching, or land clearing can create nuisances or localized health impacts. Actual pounds per day of dust generated by project construction can be calculated with URBEMIS. However, even projects not exceeding district PM thresholds should implement best management practices to reduce dust emissions and avoid localized health impacts. Best management practices for dust can be found in Section 6.1 of this document.

5.0 Full Analysis

Lead Agencies should prepare a full air quality analysis for all projects where there is an obviously significant air quality impact, or where a screening analysis shows that the project may exceed the thresholds and cannot mitigate air quality impacts to less than significant levels. Elements needed to prepare an adequate analysis are described in this section.

5.1 Project Description

To allow for an adequate review of the potential air quality impacts of a project, the environmental document should include a comprehensive project description. The project description will most likely be in one of the introductory chapters of the environmental document. The description should include one or more maps showing the location of the project on both a local and regional scale.

5.2 Environmental Setting

In order for a full air quality analysis to be considered adequate, an environmental setting should be included. The Environmental Setting portion of the air quality impact analysis should describe ambient air quality conditions as they exist before the start of the proposed action from both a local and regional perspective, and should also provide information on the regulatory environment and describe pollutants of concern. The setting should provide sufficient information to permit independent evaluation by reviewers.

The following information should be included in the setting discussion of an air quality analysis:

- Topography and meteorology,
- Regulatory status and state and national Ambient Air Quality Standards (AAQS), including attainment status for each,
- Summary of ambient air quality, including exceedance of state and national AAQS for the previous three years,
- Existing emissions on the project site,
- Existing and reasonably foreseeable sensitive receptors near the project site (preferably shown on a map), and
- Characteristics and health impacts of the pollutants of concern.

Background information covering these areas that can be used in a full air quality analysis can be found in Appendix A of this document.

5.2.1 Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emission sources, or the duration of exposure to air pollutants. For CEQA purposes, a sensitive receptor is generically defined as a location where human populations, especially children, seniors, or sick persons are found, and there is reasonable expectation of continuous human exposure according to the averaging period for the AAQS (e.g., 24-hour, 8-hour, 1-hour). Examples of sensitive receptors include residences, hospitals, and schools. Locations of sensitive receptors may or may not correspond with the location of a source's maximum off-site concentration. The location of

sensitive receptors should be explained in terms that demonstrate the relationship to the project site and the potential air quality impacts (e.g., proximity, topography, or upwind or downwind location).

In addition to considering existing receptors, the analysis should also identify reasonably foreseeable sensitive receptors. This would include future receptors if development were pending, as well as potential receptors that could reasonably be sited nearby based on permitted zoning or land use designations. Land uses in the vicinity of the project site should be described in the Land Use Section of an EIR. If no sensitive receptors are in the project vicinity, the Land Use Section may be referenced. If sensitive receptors are in the project vicinity, the Land Use Section may also be referenced, but the description of any sensitive receptors should be expanded upon as necessary for air quality impact analysis purposes.

5.2.2 Sources of Air Pollutants in Project Vicinity

In order to evaluate the cumulative impact of a project, it is necessary to identify sources of air pollutants on or near the project site. The description of existing air pollution sources should include sources that produce criteria pollutants, toxic air contaminants, and nuisance emissions such as odors and dust. More detailed information regarding existing emissions, including emissions of odors and toxic air contaminants, may be obtained by contacting the District.

5.2.3 Transportation System

Mobile source emissions usually contribute a large part of a project's long-term operational emissions. To understand how the project will fit into the existing transportation infrastructure, the environmental document should describe the transportation system serving the project site. Discuss traffic conditions, including traffic volumes and levels of service; transit service; and other relevant transportation facilities such as bicycle facilities, shuttle services, telecommuting centers, etc. The discussion of the existing transportation system should describe both current conditions and future conditions with the project. Much of this information may be located in the Traffic and Circulation section of the environmental documents. However, many traffic and circulation sections do not adequately describe bicycle facilities, telecommuting centers, and other alternative transportation forms. The traffic and circulation information may be referenced and/or summarized, but any additional information relative to non-motorized trip reduction alternatives not discussed should be described for the project in the air quality setting.

5.2.4 Applicable District Rules

The Lead Agency should include a list of District rules with which the project would be required to comply. Compliance with these rules is independent of the CEQA process. Listed below are descriptions of District rules that would be applicable to typical development projects.

- Visible emissions from stationary diesel-powered equipment are not allowed to exceed 40 percent opacity for more than three minutes in any one-hour, as regulated under District Rule 2.3, Ringelmann Chart.
- Dust emissions must be prevented from creating a nuisance to surrounding properties as regulated under District Rule 2.5, Nuisance.
- District Rule 2.9, Open Burning, Certain Materials prohibits outside fires for the purpose of disposing petroleum waste, demolition debris, construction debris, tires or other rubber

materials, materials containing tar, or for metal salvage or burning of vehicle bodies. Any open burning requires approval and issuance of a burn permit from the District and shall be performed in accordance with District Rule 2.8, Open Burning, General.

- Portable equipment greater than 50 horsepower, other than vehicles, must be registered with either the ARB Portable Equipment Registration Program (PERP) (http://www.arb.ca.gov/perp/perp.htm) or with the District.
- Architectural coatings and solvents used at the project shall be compliant with District Rule 2.14, Architectural Coatings.
- Cutback and emulsified asphalt application shall be conducted in accordance with District Rule 2.28, Cutback and Emulsified Asphalt Paving Materials.
- In the event that demolition, renovation or removal of asbestos-containing materials is involved, District Rule 9.9 requires District consultation and permit prior to commencing demolition or renovation work.
- All stationary equipment, other than internal combustion engines less than 50 horsepower, emitting air pollutants controlled under District rules and regulations require an Authority to Construct (ATC) and Permit to Operate (PTO) from the District.
- District Rule 2.40 Wood Burning Appliances prohibits installation of any new traditional "open hearth" type fireplaces.

Lead Agency staff is encouraged to coordinate directly with the District on issues such as applicable regulatory requirements. Copies of rules and regulations can be accessed at www.ysaqmd.org/rules-gen.php or may be requested by contacting the District at the mailing address, email address, or main phone number shown on the cover sheet.

5.3 Full Air Quality Assessment

The impact analysis of an environmental document should address a project's primary impacts on air quality. Primary impacts are directly related to the project, including short-term, temporary effects from construction and long-term emissions from its operation. This includes other impacts that may affect air quality (e.g., energy use that produces emissions).

An impact analysis should support its conclusions by providing explicit reasoning. A quantitative approach should be used whenever possible, particularly when there are quantitative significance thresholds. An air quality analysis should conclude whether each impact is considered significant or less than significant prior to application of mitigation measures. The analysis should address the pollutants appropriate to the project; at a minimum, this should include the non-attainment pollutants for the District: ozone-precursors ROG and NOx and PM_{10}. The results should be compared to the appropriate unit(s) of measurement based on the applicable standard or threshold (e.g., pounds per day or tons per year).

The basic method for calculating project emissions is to apply specific emission factors to sources of air pollutants. The URBEMIS model includes emission factors for estimating emissions from construction activities, motor vehicles, and area sources, and offers conservative mass emissions computation in a user friendly Windows® environment. Therefore, the District recommends the Lead Agency use the URBEMIS model where practical. There are certain instances, explained in greater detail below, where other models or other emission estimating sources are more appropriate. Since URBEMIS is frequently updated, Lead Agencies should

make sure they are using the most up-to-date version of the model. A link is available on the CEQA section of the District's website where users can access to determine the most current version of URBEMIS. While the use of URBEMIS is the preferred approach for calculating project emissions, the Lead Agency is not precluded from using other approaches for estimating project emissions provided that the CEQA document includes a full explanation of the approach used to estimate project emissions.

5.4 Calculating Construction Emissions

Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. While construction-related emissions are considered temporary, these short-term impacts can contribute to the pollution load recorded at monitoring stations. Emissions from construction should be assessed to determine whether the thresholds of significance would be exceeded. Appropriate mitigation strategies should be described.

The most common construction activities include site preparation, earthmoving and general construction. General construction includes adding improvements such as roadway surfaces, structures and facilities. Earthmoving activities include cut and fill operations, trenching, soil compaction, and grading. Site preparation includes activities such as general land clearing and grubbing. In some cases, a project requires existing buildings and other obstacles to be demolished as part of site preparation.

The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips. URBEMIS can be used to quantify PM_{10} emissions associated with grading and earthmoving. During construction, fugitive dust, the dominant source of PM_{10} emissions, is generated when wheels or blades disturb the soil. Uncontrolled dust from construction can become a nuisance and potential health hazard to those living and working nearby. Demolition and renovation of buildings can also generate PM_{10} emissions, and is of particular concern if the building(s) contain any asbestos-bearing materials. An asbestos survey of the existing structure may be required prior to any renovation or demolition activity. If you have any questions concerning asbestos related requirements, please contact the District.

Off-road construction equipment is often diesel powered and can be a substantial source of NOx emissions. Typical construction equipment would be scrapers, tractors, dozers, graders, loaders, and rollers. The URBEMIS construction equipment defaults are considered a conservative approach. Where specific information concerning construction activities is known at the time the CEQA document is being prepared, the District recommends modifying the construction equipment assumptions to reflect real-world conditions. All changes to defaults should be clearly identified and supported.

The District recommends revising the URBEMIS 2002 version 8.7 default emission factors for the architectural coatings component of the construction module. Table 3 shows the recommended architectural coatings emission factors for residential and nonresidential structures

using updated District regulated Volatile Organic Compounds (i.e., ROG)[1] limits for Flat and Non-Flat Coatings and the South Coast AQMD revised equation. Appendix C shows the South Coast AQMD revised equations which are based on current construction survey information. The next URBEMIS upgrade will include the revised emission factors, effectively making Table 3 obsolete.

Table 3. Recommended Architectural Coatings Emission Factors for URBEMIS ver. 8.7

Structure Use	Default ROG Emission Factor (lbs/sf)	Revised ROG Emission Factor (lbs/sf)
Residential	0.0185	0.0049
Nonresidential	0.0185	0.0069
Source: South Coast AQMD URBEMIS 2002 version 8.7 Model Update (August 2005) and District Rule 2.14.		

5.4.1 Calculating Construction Emissions from Roadway Projects

The URBEMIS program has shortcomings when used for new road construction, road widening, pipeline construction, and bridge and overpass construction projects. Therefore, the Roadway Construction Emissions Model commissioned by the air districts of the Sacramento Region is recommended for estimating emissions from these types of projects. This Excel-based model is available for download from the Sacramento Metropolitan AQMD web site. The Sacramento Metropolitan AQMD 2004 Guide to Air Quality Assessment contains a methodology for quantifying the emissions impact of road construction projects. Links to the model and the Sacramento Metropolitan AQMD Guide are available on the CEQA section of the District's website.

5.5 Calculating Operational Emissions

Three types of sources: stationary sources, area sources, and mobile sources collectively make up the project's operational emissions. Information on how to calculate operational emissions from stationary, area, and mobile sources is presented below.

5.5.1 Calculating Stationary Source Emissions

The term stationary source emissions usually refers to equipment or devices operating at industrial and commercial facilities. Examples of facilities with stationary sources include manufacturing plants, quarries, print shops and gasoline stations. The air quality analysis should identify anticipated equipment and processes, and estimate their emissions. The URBEMIS model does not account for these types of stationary source emissions. The following assumptions, at a minimum, are required to estimate emissions:

- quantity of equipment
- type of equipment
- rate and quantity of fuel consumed and/or process throughput
- number of hours of operation per day

[1] For purposes of this document, volatile organic compounds (VOCs) are equivalent to (ROG). VOC emissions are generally slightly less than ROG, because the VOC definition excludes certain compounds such as ethane, acetone, methyl acetate and perchloroethylene, which do not contribute to ozone formation.

- reduction in emissions from District requirements (e.g., Rule 3.4, New or Modified Source Review; Rule 3.20, Ozone Transport Mitigation, and Rule 3.13 Toxics New Source Review)

If specific information on stationary sources is not available, the analysis should assume the most conservative approach. Where specific information is available, the analysis should use maximum daily emissions expected during the year. The latest emission factors in USEPA AP-42 (Volume I) may be used to calculate daily emissions from stationary sources unless more accurate emission data are available (e.g., actual stack test data). For equipment and processes that are not addressed in AP-42, procedures for emission calculations should be determined in consultation with the District.

As a note, stationary sources complying with applicable District regulations pertaining to Best Available Control Technologies (BACT) and offset requirements usually will not be considered a significant air quality impact. This qualification does not exempt projects with any special circumstances such as emitting objectionable odors that cause a nuisance to nearby receptors, having significant cumulative effects, or emissions associated with construction of the stationary source.

5.5.2 Calculating Area Source Emissions

Water and space heaters, fireplaces, wood burning heaters, lawn maintenance equipment, and application of paints and lacquers are examples of area source emissions which individually emit small quantities of air pollutants, but when considered collectively, represent large quantities of emissions. The URBEMIS model can estimate area-source emissions for natural gas fuel consumption from space and water heating, wood stove and fireplace combustion, landscape maintenance equipment, architectural coatings, and consumer products. Consumer products include only ROG emissions released through the use of products such as hair sprays and deodorants. Table 4 shows the District's recommended changes to default values for the area source emission module. These changes need to be made because District Rule 2.40 bans open hearth fireplaces for new developments. To assume a worst case scenario, the 10 percent default value for wood fireplaces was added to the wood stove percentage. When the Lead Agency uses values other than the District's recommended values and the URBEMIS default values, the environmental document should justify the changes. Section 5.4 includes explanation for the revised Architectural Coatings emission factors. As the same case for Table 3, the next URBEMIS upgrade will include the revised values, effectively making Table 4 obsolete.

Table 4. District Recommended Area Emission Sources Default Values.

Area Emission Sources	Default Value	Revised Value
Hearth Fuel Percentages		
Wood fireplace	10%	0%[1]
Wood stove	35%	45%[1]
Architectural Coatings		
Residential	0.0185 lbs/sf of ROG	0.0049 lbs/sf of ROG[2]
Nonresidential	0.0185 lbs/sf of ROG	0.0069 lbs/sf of ROG[2]

[1] Because District Rule 2.40 bans open hearth fireplaces for new developments, the 10% default value was added to the wood stove percentage to assume a worst case scenario.
[2] Pursuant to South Coast AQMD URBEMIS 8.7 Model Update (August 2005) methodology and District Rule 2.14 flat and non-flat high gloss coatings content.

5.5.3 Calculating Mobile Source Emissions

The source of emission factors for most California motor vehicle emission models is the ARB program EMFAC. EMFAC calculates vehicle emissions based on average emissions for each vehicle type (light duty passenger cars, light and medium duty trucks, heavy-duty diesel trucks, etc.), vehicle speed, starting conditions, temperature, year, and other factors. EMFAC generates an output in grams per mile of the various pollutants. The output can then be used in other models such as URBEMIS and DTIM, or in manual calculations, to arrive at project level emissions. URBEMIS 2002 version 8.7 calculates emissions of ROG, NOx, CO and PM_{10} and provides results either in pounds per day (summer or winter) or tons per year.

Mobile source emissions are dependent on a large number of variables, but there are several that are critical. These variables are trip length, average speed, and trip generation rates. Another variable, vehicle fleet mix, is important for projects that may have a larger share of truck traffic than average, such as distribution centers. URBEMIS contains default values for these variables, but they are very general. The defaults may be used in these instances. However, the District encourages the use of project specific data whenever it is available. Typically, this information can be found in the traffic study prepared for the project.

Transportation analyses for projects consisting of two or more types of land uses often adjust the number of anticipated trips to account for internal trips. These adjustments reflect the fact that some trips at multi-use projects will occur internally to the project. As a result, the total number of trips associated with the project would be less than the sum of trips expected from all of the land uses individually. URBEMIS contains a component that accounts for internal trips and allows the user to change the assumptions. Traffic studies for such projects may be used to identify internal trip capture rates. The air quality analysis should include a clear explanation of all internal trip capture rate assumptions unless the URBEMIS default values are used.

Traffic studies for commercial projects often distinguish between primary trips and pass-by and diverted linked trips. The air quality analysis for such projects may include emission reductions from pass-by and diverted linked trips. The emissions from these trips will be lower than for primary trips (due to shorter trip lengths), resulting in lower emissions. Adjustments can be made in the URBEMIS model to trip length and cold start/hot start assumptions for pass-by and diverted linked trips. Assumptions regarding pass-by and diverted linked trips should be clearly identified and the underlying rationale should be explained.

5.5.4 Estimating CO Impacts

As mentioned in the CO screening discussion of Section 4, there are two criteria for CO impact screening. If either is true of any intersection affected by the project with traffic mitigation incorporated, the applicant/consultant may conduct a full CO Protocol Analysis. The CO Protocol was developed by the Institute of Transportation Studies at the University of California, Davis and entitled *Transportation Project-Level Carbon Monoxide Protocol*.[2] This is a project-level protocol for use by agencies for evaluating the potential local level CO impacts of a project. Instructions for conducting this analysis are found in section 4.7.2 of the CO Protocol. If the

[2] Copies of the Protocol can be obtained on Caltrans' Air Quality website at http://www.dot.ca.gov/hq/env/air/coprot.htm

results of this analysis demonstrate no potential for significance, the Lead Agency should include the protocol analysis results in the environmental document. If the results demonstrate that the project will potentially have a significant effect on any intersection, the Lead Agency should conduct a CO dispersion modeling analysis using a program such as CALINE-4. The CALINE-4 dispersion model used to estimate local CO concentrations resulting from motor vehicle emissions was developed by California Department of Transportation (Caltrans) and is available from Caltrans Environmental Division's web page at http://www.dot.ca.gov/hq/env/air/index.htm. As a note, the quantitative screening in the CO Protocol should not be used, since the screening was developed using outdated EMFAC 7F.

CALINE-4 requires the user to supply certain input parameters. The inputs should be as recommended in the CO Protocol, except for CO background values unique to the District, which are one and zero parts per million for one and eight-hour CO background concentrations, respectively. If inputs other than those recommended in the Caltrans CO Protocol are used, they should be documented in the environmental document.

5.5.5 Evaluating Impacts of TACs

When evaluating potential impacts relating to TACs, Lead Agencies should consider both of the following situations:

1) a new or modified source of TACs is proposed for a location near an existing residential area or other sensitive receptor, and
2) a residential development or other sensitive receptor is proposed for a site near an existing source of TACs.

The District limits public exposure to TACs through a number of programs. The District reviews the potential for TAC emissions from new and modified stationary sources through the District permitting process. TAC emissions from existing stationary sources are limited by:

1) District adoption and enforcement of rules aimed at specific types of sources known to emit high levels of TACs;
2) Implementation of the Air Toxics "Hot Spots" (AB 2588) Program; and
3) Implementation of the federal Title III Toxics program.

Lead Agencies should be aware that many facilities such as solvent-based dry cleaners and gasoline stations emit toxic emissions. Under most circumstances, however, existing controls reduce impacts from these sources to less than significant levels. Therefore, it would be inappropriate to automatically reject such facilities just because they are near a sensitive receptor. More detailed analysis to determine the potential risk and feasible control measures would be appropriate in these cases. Facilities and equipment that require permits from the District are screened for risks from toxic emissions and are required to install Toxic Best Available Control Technology (T-BACT) to reduce the risks to below significance. If a significant impact remains after T-BACT is implemented, an air permit may not be issued unless it meets the discretionary approval criteria of the District's Risk Management Policy for Permitting New and Modified Sources.

While stationary TAC sources are regulated under District permitting programs, mobile sources of TAC are largely unregulated and can contribute to elevated health risks when located near receptors. Primary mobile TAC sources include freeways that experience truck traffic, or sources that attract diesel truck traffic such as warehousing facilities or truck stops. As discussed in Section 4, the ARB Handbook provides screening distances for many TAC sources. If a project would place one or more receptors near a TAC source at a distance that is less than that indicated in the ARB Handbook, the project would be considered to have an elevated risk. In these cases, it is advisable to conduct a health risk assessment using a dispersion model to calculate this increased risk.

5.5.6 Evaluating Cumulative Air Quality Impacts

CEQA defines cumulative impacts as two or more individual effects which, when considered together, are either significant or "cumulatively considerable," meaning they add considerably to a significant environmental impact. Cumulative impacts can result from individually minor but collectively significant projects (CEQA Guidelines §15355). An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed. The Cumulative Impact and Plan Consistency thresholds discussed in section 3 and Appendix B.3 describe the District's basis for performing this analysis for ozone and PM_{10}. In short, project emissions that are not consistent with the AQAP, SIP, or exceed District thresholds will have a significant cumulative impact unless offset.

Cumulative CO impacts are accounted for in the CO hotspot analysis described earlier in this section. The CALINE-4 model uses background concentrations that include CO contributions from other sources. Traffic levels used in the model should include all reasonably foreseeable projects that will contribute traffic to the intersections and road segments being analyzed.

Cumulative analyses for TACs focus on local impacts to sensitive receptors. A single source of TACs may be small, but when combined with emissions from neighboring sources, it could expose sensitive receptors to significant pollutant levels. Cumulative analysis of TACs can be accomplished by identifying all sources of these pollutants near the project site. If dispersion modeling is found to be appropriate after initial screening, as discussed earlier, the applicant should include all TAC sources in the vicinity that may influence receptors.

5.5.7 Evaluating Odors

The District is responsible for enforcing the provisions of California Health and Safety Code Section 41700 which prohibits the discharge of anything that could endanger the comfort or health of the public. Nuisance odors are regulated by this section, although certain odors are exempted, such as odors from agricultural activities and composting facilities. The District enforces Section 41700 through its nuisance rule. Any actions related to odors are based on citizen complaints to local governments and the District. Lead agencies can make a determination of significance based on a review of the District complaint records for the odor source in question. For a project locating near an existing source of odors, the impact is potentially significant when the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source.

For projects locating near a source of odors where there is currently no nearby development and for odor sources locating near existing receptors, the determination of significance should be based on whether odor complaints from the public have occurred in the vicinity of a similar facility at a similar distance.

Although distance between an odor source and a receptor is the primary factor in determining the significance of an odor impact, the prevailing wind direction should also be considered. Since odors more or less travel downwind of a source, a receptor that is upwind of a source may not experience the same impact as a receptor that is at a similar distance from the source, but is downwind.

5.5.8 Evaluating Project Alternatives

An analysis of alternatives should discuss whether any of the alternatives would eliminate or reduce any significant impacts on air quality to less-than-significant levels. Conversely, if an alternative creates a new significant impact, the impact must be addressed, though in less detail than in the project analysis. If a quantitative analysis for a particular project impact was performed, a quantitative analysis of one or more alternatives may be performed for purposes of comparison.

5.5.9 Assessment of Plans and Multiple Phased Projects

Planning documents such as city and county general plans, specific area plans and redevelopment plans should also be evaluated for their potential air quality impacts. For general plans, the evaluation of the plan's air quality impacts should focus on an analysis of the plan's consistency with the most recently adopted AQAP and/or SIP. To evaluate local plan consistency with the regional air quality plans, the Lead Agency should consider the following: the local plan's consistency with AQAP and SIP population and vehicle use projections, the extent to which the plan implements AQAP and SIP transportation control measures, and whether the plan provides buffer zones around sources of odors and toxics.

A Program EIR is appropriate for phased projects or a series of individual projects that comprise a larger project with significant impacts. A Program EIR ensures consideration of the cumulative impacts of the entire project, as opposed to a case-by-case analysis of the project's individual components. The air quality analysis for a phased project should analyze the temporary impact of construction activities for each phase of the larger project. For the operational air quality impact analysis of phased projects or specific plans, the full analysis may have to rely on assumptions regarding actual specific land uses. In many cases, specific uses are not necessarily known. The Lead Agency should use its best judgment to forecast the most likely land uses that will be built during each phase of the project. Emissions should be estimated for these forecasted uses. Emissions for all phases of a project should be totaled to determine the project's total impact upon build-out.

5.5.10 Evaluating Project Greenhouse Gases

In AB 32, the Legislature recognized California's particular vulnerability to the effects of global warming, making legislative findings that global warming will "have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry." (H&SC section 38501, subd. (b)). Residents of the District

will be affected by many of these climate change effects, particularly given the importance to Yolo and Solano Counties of their agricultural economy, economic dependence on tourism, recreational fishing, and recreational boating. The Legislature also found that global warming will "increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the State." (H&SC, section 38501, subd. (b)). Since Yolo and Solano Counties are among the parts of the State that experience hot weather, this area is at a greater likelihood of suffering from any electricity shortages that are manifestations of global warming. It may also experience economic and public health damages related to changes in vegetation and crop patterns, lower summer reservoirs, and increased potential for flooding and air pollution that hotter temperatures can produce.

AB 32 mandates that emissions of greenhouse gases must be capped at 1990 levels (H&SC, section 38530). Considering that about 40% of greenhouse gas emissions come from motor vehicles, projects that generate new vehicle trips can be in conflict with AB 32 goals. While there are no specific thresholds associated with greenhouse gases, it is still recommended to at least include a qualitative discussion of greenhouse gases in air quality analyses for sizable projects. The issue of greenhouse gases is increasingly becoming an area of comment on draft environmental documents. The EIR's for several transportation plans and general plans have received comments from the State Attorney General asking that an analysis of greenhouse gases be included. In order to pro-actively address this issue, Lead Agencies should consider preparing such an analysis for larger projects as part of their full analysis.

6.0 Mitigating Air Quality Impacts

CEQA §21002.1(b) requires lead agencies to mitigate or avoid significant environmental impacts associated with discretionary projects. Environmental documents for projects that have one or more significant environmental impacts must identify feasible mitigation measures or alternatives to reduce the adverse impacts below a level of significance. According to CEQA, "'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (CEQA Guidelines §15364). In cases where significant impacts are not at least avoided or substantially lessened, the Lead Agency may approve the project if it first adopts a "statement of overriding considerations." The statement of overriding considerations sets forth the specific reasons why the Lead Agency found that the project's benefits outweigh its unavoidable adverse environmental effects (CEQA Guidelines §15043).

In addition to being a CEQA requirement, mitigation of impacts is needed to achieve federal and state air quality standards. All incremental emission sources, including those associated with land development must be mitigated to the greatest extent possible in order to achieve and maintain ambient air quality standards and greenhouse gas reductions. What the District considers to be feasible mitigation is discussed below. However, the District recognizes that the final determination of feasibility for a project will be determined by the Lead Agency.

The URBEMIS model includes a mitigation component that can calculate emission reductions for various mitigation measures. URBEMIS provides mitigation for construction activities, area sources and motor vehicle use related to a project. The URBEMIS user's guide provides instructions regarding the use of the mitigation component. The mitigation measures discussed below compliment those found in URBEMIS. By no means are these the only measures the Lead Agency can use. The Lead Agency is encouraged to explore and incorporate additional feasible mitigation measures where appropriate.

6.1 Construction Dust Mitigation

Fugitive dust PM_{10} emissions from construction can vary greatly depending on the activity taking place, the equipment being operated, local soils, weather conditions and other factors. Despite this variability in emissions, experience has shown that there are a number of control measures that can be reasonably implemented to significantly reduce construction fugitive dust PM_{10} emissions. Common measures include watering, chemical stabilization of soils or stockpiles, and reducing surface wind speeds with windbreaks. Table 5 includes feasible mitigation measures for controlling dust and summarizes the sources of emissions that would be affected, the effectiveness of the measure in mitigating emissions, and the references for the assumptions.

Table 5. Construction Dust Mitigation Measures

Mitigation Measure	Source Category	Effective	References
Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.	Fugitive emissions from active, unpaved construction areas	50%	U.S. EPA, "AP-42, Vol. I." Pg. 11.2.4-1.
Haul trucks shall maintain at least 2 feet of freeboard.	Spills from haul trucks	90%	Monterey Bay Unified APCD
Cover all trucks hauling dirt, sand, or loose materials.	Spills from haul trucks	90%	Monterey Bay Unified APCD
Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.	Wind erosion from inactive areas	Up to 80%	U.S. EPA, "AP-42, Vol. I." Pg. 11.2.4-1.
Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).	Wind erosion from inactive areas	Up to 80%	South Coast AQMD, "SIP for PM_{10} in the Coachella Valley" 1990. Pg. 5-15
Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.	Wind erosion from inactive areas	4% (15% for mature trees)	South Coast AQMD, "SIP for PM_{10} in the Coachella Valley" 1990. Pg. 5-15
Plant vegetative ground cover in disturbed areas as soon as possible.	Wind erosion from inactive areas	5%-99% (based on planting plan)	South Coast AQMD, "SIP for PM_{10} in the Coachella Valley" 1990. Pg. 5-15
Cover inactive storage piles.	Wind erosion from storage piles	Up to 90%	U.S. EPA "AP-42, Vol. I." Pg. 11.2.3-4)
Sweep streets if visible soil material is carried out from the construction site.	On-road entrained PM_{10}	14%	U.S. EPA Report Number EPA-600/R-95-171
Treat accesses to a distance of 100 feet from the paved road with a 6 to 12 inch layer of wood chips or mulch.	Mud/dirt carryout on-road entrained PM_{10}	27-33%	U.S. EPA Report Number EPA-600/R-95-171
Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.	Mud/dirt carryout on-road entrained PM_{10}	42-52%	U.S. EPA Report Number EPA-600/R-95-171
Note: The effectiveness of 2 or more mitigation measures that address the same source of emissions would not be the sum of both measures.			

Mitigation measure effectiveness can be quantified by identifying the source of PM_{10} that would be affected, estimating emissions from the source, and applying a mitigation effectiveness factor to those emissions. For example, watering active, unpaved construction areas with full coverage can reduce fugitive PM_{10} from construction activities by 50%. When multiple measures are applied to the same source of PM_{10}, the effectiveness of a second measure would be based on the amount of PM_{10} that remains after implementing the first or primary mitigation measure.

6.2 Construction Equipment Exhaust Mitigation

Mitigation of construction equipment exhaust should focus on strategies that reduce NOx, ROG, and PM_{10} emissions. These strategies may include restricting unnecessary vehicle idling to 5 minutes, using reformulated and emulsified fuels, incorporating catalyst and filtration technologies, and modernizing the equipment fleet with cleaner repower and newer engines, among others. Many of the heavy-duty diesel mitigation measures may qualify for state and District incentive funding programs. Contact the District if interested in knowing more about our incentive funding programs.

The Lead Agency is encouraged to explore and incorporate other mitigation measures as technology advances and less emissive products become available at lower costs. As a resource and emission reduction calculator, the URBEMIS construction mitigation component includes pre-defined measures with specific emission reduction effectiveness. The District is available to assist in developing a customized construction mitigation program that is appropriate for the project.

6.3 Stationary Source Mitigation

Emissions from new and modified stationary sources are generally controlled through the District's permitting process. Most new and modified stationary sources will be subject to BACT requirements. However, any stationary source not regulated by District rules may also apply BACT if they so choose. The District is available to assist sources in determining which technologies are available to control facility emissions.

6.4 Area Source Mitigation

Land development projects produce pollution from area-wide sources such as consumer product use, fireplaces, water and space heaters, house paints, and landscape equipment. The URBEMIS program provides area source emission mitigation measures and their associated emission reductions.

The District encourages residential and commercial projects to help offset area source emissions through "green" building designs. Such projects benefit air quality by using energy more efficiently. Green buildings incorporate location, design, construction and energy systems to reduce the use of non-renewable energy resources. Energy conservation measures are available for projects to reduce the need for natural gas and electricity. These should be incorporated into project building plans where appropriate. Some potential green building measures are listed below:

- Duct system within the building thermal envelope, or insulated to R-8[3]
- Passive cooling strategies including passive or fan-aided cooling planned for or designed into structure, a cupola or roof opening for hot air venting or underground cooling tubes
- Outdoor lighting designed for high efficiency, solar-powered or controlled by motion detectors
- Natural lighting in buildings
- Building siting and orientation to reduce energy use
- Summer shading and wind protection measures to increase energy efficiency
- Use of concrete or other non-polluting materials for parking lots instead of asphalt
- Use of landscaping to shade buildings and parking lots
- Photovoltaic and wind generators
- Installation of energy efficient appliances and lighting
- Installation of mechanical air conditioners and refrigeration units that use non-ozone depleting chemicals

More information about incorporating the features mentioned above can be found at California's Consumer Energy Center web site. A link to the site is available on the CEQA section of the District's website.

6.5 Motor Vehicle Mitigation

The URBEMIS model includes a motor vehicle mitigation component that quantifies the emission reductions achieved at the development level. Reducing vehicle activity can generally mitigate the emissions from motor vehicles that travel to and from residential, commercial, institutional, and some industrial land uses (i.e., indirect sources). The URBEMIS motor vehicle mitigation component is the most complex of the three mitigation components, and is designed to be quantitative and less subjective. The URBEMIS help feature (press F1 button) of the appropriate operation provides instruction for the mitigation component. Given that changes in travel behavior are variable and influenced by numerous parameters, URBEMIS excludes some mitigation measures even though they are likely to have an impact on travel behavior. This is because they either cannot be readily quantified, or because it would risk double counting mitigations already quantified elsewhere (see below).

In Section 2 of this document, it is noted that many mitigation measures that can help reduce vehicle emissions are a function of project design, and that in order to incorporate these measures into the project design, the measures should be considered as early as possible in the process. However, even after the project design phase, there are still mobile emission-reduction measures that can be implemented by a Lead Agency. When these concepts are implemented, they can increase the use of alternative travel modes, and consequently reduce mobile emissions.

- Street trees
- Direct pedestrian connections

[3] R-value: A measure of a material's resistance to heat flow in units of Fahrenheit degrees x hours x square feet per Btu. The higher the R-value of a material, the greater its insulating capability. The R-value of some insulating materials is 3.7 per inch for fiberglass and cellulose, 2.5 per inch for vermiculite, and more than 4 per inch for foam. All building materials have some R-value. For example, a 4-inch brick has an R-value of 0.8, and half-inch plywood has an R-value of 0.6.

- Zero building setbacks
- Pedestrian signalization and signage
- Street furniture and artwork
- Street lighting
- Availability of bicycle parking
- Design safe routes to schools
- Ensure that infrastructure is provided to accommodate transit. This may include:
  - Transit route signs and displays
  - Transit stop amenities
  - Bus turnouts and bulbs
- Design building elevations maximizing visual interest for pedestrians.

Please see Section 2 of this document for more information on how to effectively implement and quantify measures such as these.

6.6 Mitigating Impacts of TACs

Specific mitigation measures should be identified and considered for those projects that may release TACs to the atmosphere in amounts that may be unhealthy for nearby receptors. Mitigation measures should consider both routine and non-routine TAC releases. Mitigation measures may involve handling, storage, and disposal methods that minimize release of TACs to the atmosphere. In some cases, air pollution control devices or modifications to processes can be employed. Furthermore, facilities that may release TACs to the atmosphere should be located as far as possible from sensitive receptors such as residences, schools, day-care centers, extended-care facilities, and hospitals.

Land use conflicts are best addressed on an individual basis. The District is available to assist cities and counties in evaluating local government options and strategies for minimizing existing pollution exposure problems. Options may include relocation, redevelopment, rezoning, process changes, incentive programs, and others.

As discussed, while stationary source projects are mostly regulated by the District, mobile sources are not. Consequently, projects where significant numbers of diesel powered vehicles will be operating such as truck stops, transit centers, and warehousing may create risks from toxic diesel particulate emissions. These facilities and vehicles are not subject to District permit and so may need mitigation measures adopted by the Lead Agency to reduce their impact. Measures are available such as idling limits, electrifying truck stops to power truck auxiliary equipment, use of diesel particulate filters, and use of alternative fuel heavy-duty trucks. As mentioned above, the most effective strategy may be to place these types of projects as far as possible from sensitive receptors.

6.7 Mitigating Odor Impacts

Probably the most effective mitigation measure available to reduce odor impacts is the establishment of a buffer between the odor source and the nearest receptor. The dimensions of the buffer zone should ensure that the project does not expose the public to nuisance levels of odorous emissions. In establishing the appropriate dimensions of the buffer zone, the Lead Agency should consider actions currently being taken at the facility to control odors, as well as

any future actions to which the facility is firmly committed. A safety margin also should be considered in establishing a buffer zone to allow for future expansion of operations at the source of the odors. In order to determine the appropriate buffer distance, a Lead Agency can research similar facilities to ascertain whether odor complaints have been registered by nearby receptors.

In order to reduce the dimensions of the buffer zone, add-on control devices (e.g. filters or incinerators) and/or process modifications implemented at the source of the odors may be feasible, depending on the specific nature of the facility. Lead Agencies should consult the District for further information regarding add-on controls and process modifications to control odors. Odor mitigation measures for receptors (e.g. residential areas) that rely on sealing buildings, filtering air, or disclosure statements are not considered by the District to be appropriate mitigation measures to be used in place of buffer zones or technical controls.

6.8 Mitigating Plan Level Air Quality Impacts

General plans, community plans, specific plans and policy documents often set the pattern of new development for the next twenty or more years. The District encourages local agencies to incorporate policies that support strategies for reduced growth in motor vehicle use. Listed below are four ways that local agencies can assist air quality officials in reducing emissions from motor vehicle use.

1. Develop policies to shift travel behaviors away from single-occupant vehicle use to modes such as transit, carpools, bicycling, and walking;
2. Eliminate the need for trips and reduce the distances traveled through the design, mix, and location of land uses and roads;
3. Change fleet vehicles to those using cleaner burning fuels; and
4. Support the District's programs to reduce emissions from mobile sources.

There is increasing recognition that land use pattern and site design are critical to the success of measures implementing the first two strategies. Additional strategies the District recommends that cities and counties can implement to make their communities more transit, bicycle, and pedestrian-friendly, and avoid land use conflicts that lead to toxics and nuisance problems are summarized as follows:

- Integrate land use plans, transportation plans, and air quality plans;
- Plan land uses in ways that support a multi-modal transportation system;
- Take local action to support programs that reduce congestion and vehicle trips;
- Plan land uses to minimize exposure to toxic air pollutant emissions from industrial and other sources.

Implementation of these strategies on an individual project basis can still be beneficial, even absent a community-wide strategy, but the benefits will be greater if implemented broadly.

Quantifying plan level mitigation measures is difficult, but possible. The most effective method to calculate mobile source reductions would be to use a mode split traffic model (e.g., SACOG's SACMET model) to show the difference in trips, vehicle miles traveled and emissions based on projected increases in carpooling, transit, bicycling, and walking. The benefits of community

programs to reduce area source emissions from sources such as residential water and space heating, landscape maintenance, and woodburning can be quantified based on population growth projections and estimates of program penetration. Emission factors for the standard equipment and for the less polluting alternatives can then be used to calculate emissions under the different scenarios.

6.9 Mitigation of Greenhouse Gases

The Governor has recognized, "mitigation efforts will be necessary to reduce greenhouse gas emissions and adaptation efforts will be necessary to prepare Californians for the consequences of global warming." (Executive Order S-3-05, June 1, 2005.) The Lead Agency can require mitigation measures through alterations of its building codes or permit requirements; e.g., it might require solar heating capabilities for all new development, or require that carbon sequestration credits be purchased for developments exceeding a certain size. The Lead Agency could take direct action to offset its own carbon emissions, or those of its residents, by providing for increased public transportation service, increased support of alternative fuels and technologies, or other measures to reduce the impacts of CO_2.

APPENDICES

APPENDIX A – Background Information for Environmental Setting

A1 Topography and Meteorology

The District is located within the boundaries of the Sacramento Valley Air Basin (SVAB). The SVAB encompasses eleven counties including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties, the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat.

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, and the rainy season generally occurs from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the "Schultz Eddy" prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the District. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the delta sea breeze arrives.

A2 Air Quality Regulatory Framework

Responsibility for protecting air quality is given to both federal, State, regional, and local government agencies. Table A1 summarizes the responsibilities of each agency with jurisdiction over air quality. The regulatory framework is described in more detail below.

A2.1 Federal Environmental Protection Agency

The USEPA is responsible for implementing national air quality programs established under the Federal Clean Air Act (FCAA). The first FCAA was enacted in 1963 and empowered the Secretary of Health, Education, and Welfare to define air quality criteria. The FCAA was

amended in 1970. With this amendment, the President decided to establish an autonomous regulatory body to oversee the enforcement of environmental policy. Thus, the USEPA was created. The FCAA was again substantially amended in 1977, and again in 1990.

Table A1 Air Quality Management Regulatory Responsibilities

Govt. Level	Legislation	Implementing Agency	Responsibilities
Federal	Clean Air Act	Environmental Protection Agency	Enforce FCAA, establish national ambient air quality standards, regulates emission sources such as aircraft, ships, and certain types of locomotives
State	California Clean Air Act (H&S § 39600 et seq.) AB 1807, Air Toxics Contaminants Act	California EPA and Air Resources Board, Office of Environmental and Health Hazard Assessments	Implement CCAA, meet state requirements of FCAA, establish state ambient air quality standards, set CA vehicle emission standards
Regional	California Health and Safety Code §39000 - §44474 Local Resolutions	Yolo-Solano AQMD	Monitor air quality, design programs to attain and maintain state and federal ambient air quality standards, developed air quality rules that regulate point source, area source and certain mobile source emissions, establish permitting requirements for stationary sources, enforce air quality rules through inspections, education, training, or fines.
Local	Local Ordinance Air Quality Element of a General Plan	Public Agencies including Local Governments and County Transportation Commissions	Control or mitigate air pollution through police powers and land use decision-making authority, General Plan air quality elements, congestion management program, local ordinances, administrative actions, CEQA review and mitigation monitoring

The USEPA is involved with global, international, national, and interstate air pollution issues. Its primary role at the state level is one of oversight of state air quality programs. The USEPA sets federal vehicle and stationary source emission standards and provides research and guidance on air pollution programs.

The FCAA required the USEPA to set National Ambient Air Quality Standards (NAAQS) for several problem air pollutants on the basis of human health and welfare criteria. Very simply, an ambient air quality standard is the definition of "clean air." Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction. Primary NAAQS were established for the following "criteria" air pollutants (so called because they were established on the basis of health criteria):

- Ozone,

- Particulate Matter (PM_{10}, $PM_{2.5}$),
- Nitrogen Dioxide (NO_2),
- Carbon Monoxide (CO),
- Sulfur Dioxide (SO_2),
- Lead (Pb).

The primary NAAQS standards are intended to protect, with an adequate margin of safety, those persons most susceptible to respiratory distress, such as people suffering from asthma or other illness, the elderly, very young children, or people engaged in strenuous work or exercise. Table A2 presents the NAAQS. The NAAQS as shown in Table A2 were current as of the printing of this document, but may be changed over time. Current NAAQS may be found on the ARB's website. A link to this portion of the ARB website can be found on the CEQA section of the District's website.

The FCAA required each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The FCAA 1990 Amendments (FCAAA) added requirements for states containing areas that exceed the NAAQS to revise their SIPs in order to incorporate additional control measures to reduce air pollution. The District is part of the USEPA's designated Sacramento Area Federal Ozone Non-attainment Area. The SIP is a living document that is periodically modified to reflect the latest emission inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA has responsibility to review all state SIPs to determine if they conform to the mandates of the FCAAA and will achieve air quality goals when implemented. If the USEPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the non-attainment area and may impose additional control measures. Failure to obtain an approved SIP or to implement the plan within mandated timeframes can result in limitations being applied to transportation funding and sanctions being placed on stationary air pollution sources in the air basin.

A2.2 State Air Resources Board

The California Air Resources Board (ARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing its own air quality legislation, called the California Clean Air Act (CCAA), adopted in 1988. The ARB has primary responsibility in California for developing and implementing air pollution control plans designed to achieve and maintain the NAAQS established by the USEPA. Whereas the ARB has primary responsibility and produces a major part of the SIP for pollution sources that are statewide in scope, it relies on the local air districts to provide additional strategies for sources under their jurisdiction. The ARB combines its data with all local district data and submits the completed SIP to the USEPA. The SIP consists of the emissions standards for vehicular sources and consumer products set by the ARB, and attainment plans adopted by the air districts and approved by the ARB.

States may establish their own standards, provided the state standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to H&SC §39606(b) and its predecessor statutes. Table A2 also presents the CAAQS.

In addition to the eight criteria pollutants established by the NAAQS, the CAAQS includes Hydrogen Sulfide, Vinyl Chloride, and Visibility Reducing Particles.

Table A2. Ambient Air Quality Standards

Pollutant	Unit of Measure	California[1]	National[2]
Ozone	1-Hour 8-Hour	0.09 ppm 0.07 ppm	— 0.08 ppm
Carbon Monoxide	1-Hour 8-Hour	20.0 ppm 9.0 ppm	35.0 ppm 9.0 ppm
Nitrogen Dioxide	1-Hour Annual	0.18 ppm 0.30 ppm	— 0.05 ppm
Sulfur Dioxide	1-Hour 24-Hour Annual	0.25 ppm 0.04 ppm —	— 0.14 ppm 0.03 ppm
Coarse Particulate Matter (PM_{10})	24-Hour Annual Average	50 µg/m 20 µg/m	150 µg/m —
Fine Particulate Matter ($PM_{2.5}$)	24-Hour Annual Average	— 12 µg/m	35 µg/m 15 µg/m
Sulfates	24-Hour	25 µg/m	—
Lead[4]	30-Day Average Calendar Quarter	1.5 µg/m —	— 1.5 µg/m
Hydrogen Sulfide	1-Hour	0.03 ppm	—
Vinyl Chloride[4]	24-Hour	0.010 ppm	—
Visibility Reducing Particles	8-Hour	[3]	—

[1] California standards for Sulfates, Lead, Hydrogen Sulfide, and Vinyl Chloride are values that are not to be equaled or exceeded. All others are not to be exceeded.

[2] Only the primary standards are established to protect the public health and are the most stringent federal standards. The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[3] In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

[4] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

ppm = parts per million

µg/m^3 = micrograms per cubic meter

Sources: California Air Resources Board (02/22/07), for more information please call ARB-PIO at (916) 322-2990.

The H&SC §39608 requires the ARB to "identify" and "classify" each air basin in the state on a pollutant-by-pollutant basis. Subsequently, the ARB has designated areas in California as non-attainment based on violations[4] of the CAAQS. Table A3 shows the District's designations. These designations were current at the time this document was published, but are subject to change. Applicants should check designations on the ARB website.

[4] A violation is different than an exceedance. An exceedance is a day with a maximum ozone concentration that is higher than the standard. An exceedance does not necessarily cause a violation. A violation occurs when enough exceedances have occurred for the area to be considered not in attainment of the standard according to ARB methodology.

Table A3. District Status for the California and National Ambient Air Quality Standards.

Pollutant	Averaging Time	State Standards	National Standards
Ozone	1-Hour 8-Hour	Non-attainment Non-attainment	N/A Non-attainment
Carbon Monoxide	1-Hour 8-Hour	Attainment Attainment	Unclassified/Attainment Unclassified/Attainment
Nitrogen Dioxide	1-Hour Annual	Attainment N/A	N/A Attainment
Sulfur Dioxide	1-Hour 24-Hour Annual	Attainment Attainment N/A	N/A Attainment Attainment
Coarse Particulate Matter (PM_{10})	24-Hour Annual Average	Non-attainment Non-attainment	Unclassified N/A
Fine Particulate Matter ($PM_{2.5}$)	24-Hour Annual Average	N/A N/A	Unclassified Unclassified
Sulfates	24-Hour	Attainment	N/A
Lead	30-Day Average Calendar Quarter	Attainment N/A	N/A Attainment
Hydrogen Sulfide	1-Hour	Attainment	N/A
Vinyl Chloride	24-Hour	Attainment	N/A
Visibility Reducing Particles	8-Hour	Attainment	N/A

Notes: N/A – not applicable, state or federal standard does not exist for the combination of pollutant and averaging time. Unclassified areas are those for which air monitoring has not been conducted but which are assumed to be in attainment.
Source: California Air Resources Board State and National Area Designation Maps (www.arb.ca.gov/desig/adm/adm.htm)

For all non-attainment categories except particulate matter, attainment plans are required to demonstrate a five-percent-per-year reduction in non-attainment air pollutants or their precursors, averaged over consecutive three-year periods, unless an approved alternative measure of progress is developed. In addition, the air districts in violation of CAAQS are required to prepare an Air Quality Attainment Plan (AQAP) that lays out a program to attain and maintain the CCAA mandates.

The ARB also has some responsibility for monitoring air quality. The ARB has established and maintains, in conjunction with the air districts, a network of sampling stations called the State and Local Air Monitoring (SLAMS) network that monitor actual pollutant levels present in the ambient air. The ARB website lists monitoring stations active in the District. In addition, it indicates which pollutants are monitored and the agency responsible for site operations. The ambient air monitoring program in the District serves three primary goals:

1. Collect accurate real-time measurements of ambient pollutant levels at the four sites located in the District. The data can be used to issue timely health advisories, when necessary.
2. Generate data to determine both the State and federal attainment status of the District.
3. Generate data to evaluate the effectiveness of State and District rules and regulations.

The ARB also sets emissions standards for new motor vehicles, consumer products, small utility engines, and off-road vehicles. In many cases, California standards are the toughest in the nation.

State law recognizes that air pollution does not respect political boundaries and therefore requires the ARB to divide the state into separate air basins that have "similar geographical and meteorological conditions" while still making "considerations for political boundary lines whenever practicable" [H&SC §39606(1)]. Originally, air pollution was regulated separately by county. Although this is still the practice in many counties in California, the District was established in 1971 by a joint powers agreement between the Yolo and Solano County Board of Supervisors. The District is governed by a Board of Directors composed of representatives from both the county boards of supervisors and city council members from the cities within the District. The District has jurisdiction over all of Yolo County and the northeast portion of Solano County, from Vacaville on the west, to Rio Vista on the South. The District includes about 1,600 square miles and a population of approximately 325,000 people.

A2.3 Local Air Districts

The District is tasked with achieving and maintaining healthful air quality for its residents. This is accomplished by establishing programs, plans, and regulations enforcing air pollution control rules in order to attain all state and federal ambient air quality standards and minimize public exposure to airborne toxins and nuisance odors.

The District has adopted several attainment plans to achieve state and federal air quality standards and comply with CCAA and FCAAA requirements. The District continuously monitors its progress in implementing attainment plans and must periodically report to the ARB and the USEPA. The District, in partnership with the five air districts in the Sacramento Metropolitan Area, ARB, and SACOG, periodically revises its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the CCAA and FCAAA.

The 1994 Sacramento Area Regional Ozone Attainment Plan is the current federal ozone plan (SIP) for the District, and sets out stationary source control programs and statewide mobile source control programs for attainment of the 1-hour ozone standard. The districts of the Sacramento Region have also prepared an 8-hour Ozone Rate of Progress Plan that shows a 3% per year emission reduction in volatile organic compounds (or the NOx equivalent) for 6 years (through 2008). This plan continues the strategies found in the 1-hour ozone SIP. The USEPA's June 2005 revocation of the 1-hour ozone standard and enacting the 8-hour ozone standard required the air districts and ARB to prepare a new attainment demonstration SIP. An 8-hour ozone attainment demonstration plan for the Sacramento Metropolitan Area is currently under development and will contain additional control measures to demonstrate that the region will attain the 8-hour standard by the target date, 2013. Please review the Sacramento Metropolitan Air Quality Management District's website for the most current information on the most recent ozone plan. A link to this portion of the Sacramento website can be accessed from the CEQA section of the District's website.

The CCAA requires districts to adopt air quality attainment plans and to review and revise their plans to address deficiencies in interim measures of progress once every three years. The

District's AQAP was adopted in 1992 and most recently updated in 2003. The current plans used to comply with CCAA and FCAAA requirements can be downloaded from the District web site.

The District's primary means of implementing air quality plans is by adopting rules and regulations. The H&SC §42300 et. seq. authorizes districts to adopt rules and regulations and to pursue civil and criminal penalties for violations. The District rulebook contains more than 85 rules. Some new rules adopted by the District apply to sources never before regulated, such as Rule 2.40 - Wood Burning Appliances, which prohibits installation of any new traditional "open hearth" type fireplaces within the District's jurisdiction.

In addition to the District's primary role of controlling stationary sources of pollution, the District is required to implement transportation control measures and identify indirect source control programs to reduce mobile source emissions. To accomplish this, the District works closely with cities and counties and with regional transportation planning agencies. The District has also enhanced its participation in CEQA where it actively reviews and comments on prepared environmental documents. Also, the District encourages cities and counties to include air quality policies for reducing emissions generated by indirect sources in their General Plans. The District coordinates with the transportation planning agencies [e.g., Sacramento Area Council of Governments (SACOG), Yolo County Transportation District, UC Davis Transportation and Parking Services and Unitrans, and Solano Transportation Authority] to help them comply with pertinent provisions of the federal and State Clean Air Acts, as well as related transportation legislation (such as the Safe, Accountable, Flexible, Efficient Transportation Equity Act for the 21st Century – A Legacy for Users, Congestion Management Act, Transportation Improvement Plans, etc.).

A3 Ambient Air Quality and Pollutant Characteristics

As discussed in Section 5, the environmental setting discussion of an EIR or Negative Declaration should summarize ambient air quality by summarizing the District's attainment status for federal and State AAQS and by identifying exceedences of CAAQS and NAAQS for the previous three years using data from the closest ambient monitoring station to the project site.

A3.1 Determining Attainment Status

At publication date, the District is in non-attainment of State and federal ozone standards and non-attainment of the State standard for PM_{10}. When an area is designated by the government as "non-attainment" for an air quality standard, it means that the standard is not achieved. The District is in attainment for all other criteria pollutant standards. ARB's website gives current information about the District's attainment status for federal and State ambient air quality standards. A link to this portion of the ARB site can be accessed on the CEQA section of the District's website.

A3.2 Finding Monitoring Data

Ambient air quality in the District is monitored at four monitoring stations. Some stations monitor ozone, PM_{10}, and carbon monoxide or a combination thereof. Other stations monitor only one specific pollutant. There may be some variation in monitoring stations from year to year as new stations may be added, discontinued, or relocated. The air quality monitoring data

may be obtained from the ARB web site, including data from monitoring stations located within the Sacramento Metro 8-hour Ozone Planning Area. A link to this portion of the ARB site can be accessed from the CEQA section of the District's website.

A3.3 Characteristics and Health Effects of Air Pollutants

Ozone

Ozone in the lower atmosphere is one of the main components of smog. It is not directly emitted but is formed in the atmosphere over several hours from combinations of various precursors in the presence of sunlight. Reactive organic gases (ROG) and Nitrogen Oxides (NOx) are considered to be the primary compounds, or precursors, contributing to the formation of ozone. Ozone is viewed as both a secondary pollutant and a regional pollutant because ozone can form far from where precursors are emitted.

Short-term exposure to ozone can result in injury and damage to the lungs, decreases in pulmonary function, and impairment of immune mechanisms. Chronic lung disease can occur as a result of longer-term exposure. Symptoms of ozone irritation include shortness of breath, chest pain when inhaling deeply, wheezing, and coughing. Children and persons with pre-existing respiratory disease (e.g., asthma, chronic bronchitis, and emphysema) are at greater risk.

ROG are photochemically reactive hydrocarbons whose primary sources include mobile sources, consumer products, petroleum marketing (e.g., gas dispensing), coatings and solvents, and agricultural related activities. NOx is a family of gaseous nitrogen compounds whose emissions result primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicle fuel combustion is the major source of this air pollutant. In 2005 daily emissions of ROG and NOx in the District were estimated at 22 and 35 tons, respectively, with on road sources making up 29% of ROG and 52% of NOx emissions[5].

Particulate Matter

The term "particulate matter" (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. These solid and liquid particles come in a wide range of sizes.

Particles less than 10 micrometers in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles with diameters between 2.5 and 10 micrometers are referred to as "coarse." Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. Particles less than 2.5 micrometers in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to post the largest health risks. Because of their small size, fine particles can lodge deeply into the lungs. Sources of fine particles include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. In 1997, the USEPA adopted a fine particulate matter standard

[5] ARB Almanac Emission Projection Data (published in 2006), 2005 Estimated Annual Average Emissions for Yolo-Solano AQMD. All emissions are represented in Tons per Day and reflected the most current data provided to ARB (11/17/06).

for particles 2.5 microns or less in diameter ($PM_{2.5}$) for the first time, and revised the standard for PM_{10}. The ARB adopted an annual $PM_{2.5}$ standard in 2002.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility.

Carbon Monoxide

Carbon monoxide is formed by the incomplete combustion of carbon-containing material. Under most conditions, CO does not persist in the atmosphere and is rapidly dispersed. Elevated levels of CO are most likely to occur in the winter, when inversion levels trap pollutants near the ground and concentrate the CO. Since CO is somewhat soluble in water, normal winter conditions of rainfall and fog can suppress CO concentrations. Motor vehicles are the dominant source of CO emissions and adverse localized impacts can be created in areas of heavy traffic congestion.

When CO combines with hemoglobin in the blood, the oxygen-carrying capacity of the blood is reduced and the release of oxygen is inhibited or slowed. This condition places angina (uncomfortable pressure, fullness, squeezing or pain in the center of the chest) patients, persons with other cardiovascular diseases or with chronic obstructive lung disease, asthma, and persons with anemia at risk. At higher levels, CO also affects the central nervous system. Symptoms of exposure may include headaches, dizziness, sleepiness, nausea, vomiting, confusion, and disorientation.

In 2004 motor vehicles contributed approximately 71% of total CO emissions in the Sacramento Valley. Residential and agricultural burning and other mobile and miscellaneous sources contribute to the remainder. There have been no recorded violations of the federal or state CO AAQS at District monitoring stations.

Other Criteria Pollutants

The standards for NO_2, SO_2, and Lead are being met in the District, and the latest pollutant trends suggest that these standards will be attained for the foreseeable future. Ambient levels of airborne Lead are well below the state and federal standards and are expected to continue to decline. Since the phase-out of leaded gasoline, ambient lead concentrations have decreased dramatically and lead inhalation is no longer a significant health concern.

Greenhouse Gases

The California Global Warming Solution Act of 2006 (AB 32), a law to control and reduce the emissions of global warming gases in California, requires both reporting of greenhouse gas emissions and their reduction. AB32 requires the reduction of greenhouse gas emissions such as carbon dioxide (CO_2) to 1990 levels by 2020. Local governments are called upon to help carry out the provisions of AB32. Because global warming is perhaps the most serious environmental

threat currently facing California, environmental documents should address the issue by providing full disclosure of the effects on greenhouse gas emissions that the project will cause, and by adopting mitigation measures to reduce those effects.

Climate change results from the accumulation in the atmosphere of "greenhouse gases" produced by the burning of fossil fuels for energy. Because greenhouse gases (primarily, CO_2, methane and nitrous oxide) persist and mix in the atmosphere, emissions anywhere in the world impact the climate everywhere. The impacts on climate change from greenhouse gas emissions have been extensively studied and documented[6]. See the CEQA section of the District's website for links to more information on climate change.

Toxic Air Contaminants

In addition to the criteria air pollutants, TACs are another group of airborne substances known to be highly hazardous to health, even in small quantities. TACs are capable of causing short-term (acute) and long-term (chronic or carcinogenic) adverse human health effects. TACs can be emitted from a variety of common sources, including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. Agricultural and construction activities can also contribute to toxic air emissions. In 1998, the ARB has also identified diesel exhaust particulate matter (diesel PM) as a TAC.

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) requires stationary sources to report the types and quantities of toxic substances their facilities routinely release into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, and to notify nearby residents of significant risks. The ARB web site includes a Facility Search Tool to find information about toxic and criteria pollutants, including health risk information, for a specific facility. See the CEQA section of the District's website for a link to the Facility Search Tool.

Regulation of TACs is achieved through federal and State controls on individual sources. The FCAAA offers a comprehensive plan for achieving significant reduction in both mobile and stationary source emissions of certain designated TACs. All major stationary sources of designated TACs are required to obtain an operating permit and pay the required fees.

New sources that require a permit from the District, or existing sources that are being modified, will be analyzed by the District based on their potential to emit toxics. If it is determined that the project will emit toxics resulting in a lifetime cancer risk above one in one million, or the non-cancer risk Hazard Index greater than one, sources may have to implement BACT for toxics, or "T-BACT," in order to reduce toxic emissions. In addition, if the analysis shows risk greater than one in one million, a formal risk assessment should be conducted. If a source cannot reduce the risk below the ten in one million level or the non-cancer risks Hazard Index less than one even after T-BACT has been implemented, the permitting authority may have cause to deny the permit required by the source. This program helps to prevent new toxics problems, and reduces

[6] NASA and Department of Energy scientists state that emission of CO_2 and other heat-trapping gases have warmed the oceans and are leading to energy imbalance that is causing, and will continue to cause, significant warming, increasing the urgency of reducing CO_2 emissions.

increases in toxics from existing older sources by requiring them to apply new technology when retrofitting.

If any new or modified source of toxics is located within 1,000 feet of a school, the District is required by H&SC§42301.6(a) to send a notice to the parents of all students attending the school, as well as to all residences within 1,000 feet of the source. If the source locating near a school is a gas station, and initial screening indicates that the risk of cancer exceeds one in a million, the District will perform a T-BACT analysis.

Projects that will not emit any toxics themselves but will locate near a source of toxics should also evaluate whether they will be impacted by the nearby source. The District can assist in determining whether there is a toxic source in the vicinity of a proposed project. Since the District's permitting process does not address land use compatibility or siting issues, Lead Agencies that are deciding whether or not to grant a land use permit to potential sources of toxics should consider additional factors as well. These factors should include not only what the health risk may be to populations adjacent to the facility, but how granting a discretionary permit for a significant toxic source will affect future land use.

While TACs are produced by many different sources, the largest contributor to inhalation cancer risk in California is diesel PM. Exposure to diesel PM can result in an increased risk of cancer and an increase in chronic noncancer health effects including a greater incidence of cough, labored breathing, chest tightness, wheezing and bronchitis. These risks generally affect sensitive receptors near the emission source. Figure 2 (Section 4 of this document) includes the ARB Handbook recommended minimum separations between new sensitive land uses and eight categories of existing sources.

The ARB reports that the average cancer risk statewide from exposure to diesel PM was estimated to be over 500 potential cases per million in 2000[7]. Diesel PM was estimated to be responsible for about 70% of total risks from all toxics[8]. On a local scale, diesel PM can present varying cancer risks to the public, which can be greater or less than the statewide average. The ARB's risk map includes maps showing statewide trends in estimated inhalable cancer risk from estimated air toxic emissions between 1990 and 2010. A link to this ARB map has been made available on the CEQA section of the District's website. The risk from diesel PM is expected to decrease over time. The ARB has developed the "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles," which sets a goal of 75% reduction of diesel PM by 2010 and an 85% reduction by 2020.

Currently, the ARB is in the process of implementing the control measure phase of the diesel PM program. During this phase, specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles will be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art

[7] California Environmental Protection Agency, California Air Resources Board, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000, page 1.
[8] California Environmental Protection Agency, California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective, April 2005, page 12.

technology requirements or emission standards to reduce diesel PM emissions. Upcoming and proposed state and federal regulations will address the following emission sources:

- New On-Road, Off-Road and Marine Engine Standards;
- Diesel Fuel Standards;
- Retrofit Requirements; and
- After market add-on controls.

When federal and State diesel PM regulations and programs are fully implemented, the human health risks related to diesel exhaust emissions are expected to significantly decrease. Where diesel PM is considered a pollutant of concern for a project, the Lead Agency should consider diesel PM reduction strategies that are currently being implemented and strive to develop diesel PM emission control technologies that would minimize diesel risk.

APPENDIX B – Justification for Thresholds of Significance

B.1 Ozone Precursors (ROG and NOx) Threshold

What is important for determining ozone impacts is the "substantial contribution" of a project. The District defines "substantial contribution" for ozone precursor emissions in terms of California Clean Air Act (CCAA) requirements and implements it through Rule 3.20 - Ozone Transport Mitigation. By comparing a project's ozone precursor emissions with emission levels considered significant under state law, a project-level threshold of significance can be established. In the past, the District used Rule 3.4 – New Source Review: Offset Requirements that set emission thresholds above which stationary pollution sources must offset emissions. However, Rule 3.20 is more restrictive and accounts for the transport problem associated with ozone as a regional pollutant.

As required by California Health and Safety Code (H&SC) §40912, districts responsible for air pollutant transport shall provide for attainment and maintenance of the state standards in the downwind districts. The ARB identified the District, as part of the "Broader Sacramento Area," as transporting to the Upper Sacramento Valley, the Mountain Counties, the San Joaquin Valley, and the San Francisco Bay Area. Therefore, pursuant to requirements of the Transport Mitigation Regulation, the District implements Rule 3.20, Ozone Transport Mitigation, which requires a 10 tons per year "no net increase" program for nitrogen oxides (NOx) and volatile organic compounds (VOCs). For purposes of this document, VOCs are equivalent to reactive organic gases (ROG). Since stationary sources are not allowed to contribute more than10 tons per year of NOx or VOC under Rule 3.20, this number serves as the project-level threshold of significance as well.

B.2 Coarse Particulate Matter (PM_{10}) Threshold

Particulate matter (PM) larger than 2.5 microns and less than 10 microns, often referred to as coarse PM, is mostly produced by automobile tire wear, industrial processes such as cutting and grinding, and re-suspension of particles from the ground or road surfaces by wind and human activities such as construction or agriculture. Particulate emissions from these activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility. Because the District exceeds the State PM_{10} Ambient Air Quality Standards (AAQS), the District's New Source Review program requires Best Available Control Technologies (BACT) to be applied where new or modified emissions exceed 80 lbs/day for PM_{10}. Therefore, a project's PM_{10} emissions that trigger the District's BACT threshold for PM_{10} would result in substantial air emissions and have a potentially significant impact on local air quality.

B.3 Fine Particulate Matter ($PM_{2.5}$)

In contrast, PM less than or equal to $PM_{2.5}$ is mostly derived from combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary combustion sources. The particles are either directly emitted or are formed in the atmosphere from the combustion of gases, such as NOx and Sulfur Oxides (SOx) combining with ammonia. $PM_{2.5}$ can also be present when dust is generated, with the amount of $PM_{2.5}$ varying between locations with different soils. Since EPA has not yet officially proposed a $PM_{2.5}$ designation for the District, there is no threshold of significance proposed at this time.

B.4 Carbon Monoxide (CO) Threshold

Unless the project would cause a violation of State AAQS [9 parts per million (ppm) (8-hour average) or 20 ppm (1 hour average)] at existing or reasonably foreseeable receptors, the project would not have a significant impact on local air quality. CO modeling can be used to determine whether a project may cause a violation of the State AAQS for CO. Localized high levels of CO, or CO "hotspots", is the District's concern with this pollutant. Hotspots are usually associated with roadways that are congested and have heavy traffic volume. The District has accepted San Joaquin Valley Air Pollution Control District's screening approach to determine whether the effect would have a potential for significance. The screening approach is discussed in greater detail under Section 4, Assessing Air Quality Impacts - Initial Screening.

B.5 Cumulative Impact Threshold

For ground level ozone, the District prepares air quality plans that address attainment of the State and federal ozone AAQS. These plans accommodate growth by projecting growth in ozone precursor emissions based on different indicators. Through the air quality planning process, ozone precursor emission growth is offset by regional controls on stationary, area, and transportation sources of air pollution. Project ozone emissions above individual thresholds have not been accommodated in the air quality plans and are therefore not consistent with air quality plans. Emissions will have a significant cumulative impact on regional air quality unless ozone precursor emissions above the thresholds are offset.

As for PM_{10}, the District implements Senate Bill 656, codified as H&SC §39614, and has developed a subset of control measures to further reduce PM_{10} emissions from new and existing stationary, mobile and area sources. The objective is to make progress toward attainment of the State PM_{10} standard. Project PM_{10} emissions above BACT thresholds have not been accommodated in the plan and therefore the emissions will have a significant cumulative impact on District air quality unless the emissions above the thresholds are offset.

APPENDIX C – VOC Emission Factors from Architectural Coatings for Non-Residential and Residential Projects Using South Coast AQMD Methodology

C.1 Coating Emission Factor for Non-Residential Projects

Table C.1 Commercial/Industrial Projects at 150 grams per liter.

VOC Content (grams per liter)	conversion from grams per liter	conversion to pounds VOC per gallon	Coating coverage[1] (square feet per gallon)	Emission Factor (pounds per square feet)
150	454	3.785	180	0.0069

[1] Based on architectural coating data sheets and known industry, for two coats of paint typically applied at 4 mil thickness per coat.

C.2 Coating Emission Factor for Residential Projects

Table C.2 Exterior Coatings for Residential Projects at 150 grams per liter.

VOC Content (grams per liter)	conversion from grams per liter	conversion to pounds VOC per gallon	Coating coverage[1] (square feet per gallon)	Percent of Exterior Coating on Total Residential Project	Weighted Emission Factor (pounds per square feet)
150	454	3.785	180	0.25	0.00174

[1] Based on architectural coating data sheets and known industry for two coats of paint typically applied at 4 mil thickness per coat.

Table C.3 Interior Coatings for Residential Projects at 100 grams per liter.

VOC Content (grams per liter)	conversion from grams per liter	conversion to pounds VOC per gallon	Coating coverage[2] (square feet per gallon)	Percent of Exterior Coating on Total Residential Project	Weighted Emission Factor (pounds per square feet)
100	454	3.785	200	0.75	0.00313

[2] Based on architectural coating data sheets and known industry for two coats of paint typically applied at 1.2 – 1.5 mil thickness per coat.

Sum of Total Weighted Emission Factor (pounds per square feet): 0.00486