BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Pamela Torliatt and Members of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 30, 2009

Re: Public Hearing to Consider Proposed Amendments to Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, and Adoption of a CEQA Negative Declaration

RECOMMENDED ACTION:

Staff recommends that the Board of Directors take the following actions:

- Adopt proposed amendments to Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants; and
- Adopt a Negative Declaration pursuant to the California Environmental Quality Act (CEQA) for this rule-making activity.

BACKGROUND

Staff has prepared amendments to Regulation 2, Rule 5 that would incorporate updated OEHHA health risk assessment methodologies, resulting in an increase in the stringency of permitting requirements for new/modified stationary sources of toxic air contaminants (TACs). Staff has also proposed a toxics tracking provision for each Priority Community identified under the District's Community Air Risk Evaluation (CARE) program.

This item was originally scheduled to be considered by the Board at the December 16, 2009 meeting, but was postponed until the January 6, 2010 meeting. For additional details regarding the proposed rule amendments, please refer to the materials provided for the December 16 meeting.

Respectfully submitted,

Jack P. Broadbent
Executive Officer / Air Pollution Control Officer

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BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits,

Rule 5: New Source Review of Toxic Air Contaminants

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ACKNOWLEDGEMENTS:

The following District staff members participated in the development of the proposed amendments to this rule, and deserve recognition for their important contributions:

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1. Executive Summary

For more than twenty years, the District has implemented programs that are designed to identify and reduce the public's exposure to toxic air contaminants (TACs). TACs are air pollutants, which may cause or contribute to an increase in mortality or in serious illness, or which may pose a potential hazard to human health. The District's long-standing Air Toxics Program is directed at reducing TAC emissions from stationary sources. The Air Toxics Program has three main elements that integrate federal and state mandates and local goals: 1) preconstruction review of new and modified sources of TAC emissions (the Air Toxics New Source Review Program), 2) assessment and reduction of health risks from existing facilities (the Air Toxics "Hot Spots" program), and 3) air pollution control measures for specific categories of TAC sources. Over the past two decades, the District's Air Toxics Program, in conjunction with other District and state programs, has reduced cancer risk from TACs by about 70%. For the next decade, a further reduction of roughly the same magnitude is expected. This report addresses proposed changes to the District's Air Toxics New Source Review (NSR) Program, including amendments to Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants and associated procedures. The proposed changes will make the program more stringent by a factor of two to three throughout the Bay Area.

Air Toxics NSR Program:

The Air Toxics NSR Program was established in 1987 at the direction of the District's Board of Directors and was initially implemented based on policies and procedures established by the District's Air Pollution Control Officer (APCO). In 2005, the District updated the Air Toxics NSR Program and codified the Air Toxics NSR policies and procedures in Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, in the Manual of Procedures, Volume II, Part 4: New and Modified Sources of Toxic Air Contaminants, and in the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines.

The goal of the Air Toxics NSR Program is to prevent significant increases in health risks resulting from new and modified sources of TACs based on preconstruction permit review. The program is also intended to reduce existing health risks by requiring updated control requirements when older, more highly polluting, sources are modified or replaced. Regulation 2, Rule 5 contains health risk based thresholds at which a new or modified source must employ Best Available Control Technology for Toxics (TBACT) and health risk limits that each project cannot exceed. The rule also delineates the procedures to be used for calculating TAC emission increases from sources and projects and evaluating the health impacts that result from these emission increases.

When evaluating heath impacts from new and modified sources, the District follows the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines, which generally conform to State Air Toxics Hot Spots Health Risk Assessment (HRA) guidelines.

The California Office of Environmental Health Hazard Assessment (OEHHA) periodically revises the State HRA guidelines and has made a number of changes since the BAAQMD HRSA Guidelines were adopted in 2005.

The Air Toxics NSR program relies on two primary program components: (1) risk assessment, which involves estimating risk for a project using a prescribed methodology, and (2) risk management, which involves taking action on the project based on risk action levels. The stringency of the program is affected by both the methodology and the action levels. Stringency can be increased either by changes in methodology that result in a higher calculated risk or by reductions in the risk action levels.

CARE Program:

In 2004, the District initiated the Community Air Risk Evaluation (CARE) program, which focuses on assessing air pollution health impacts for specific Bay Area Priority Communities and sensitive receptors and reducing health disparities for highly impacted individuals. The CARE program takes a broader look at air pollution health impacts than the District's other toxic programs by including both stationary and mobile sources of air pollution in the health impacts analysis and by evaluating the cumulative health impacts that arise from multiple causes of air pollution in a community.

Through the CARE program, the District has determined that diesel particulate matter (PM) is the primary contributor to Bay Area air pollution health impacts, and the CARE Workgroup has identified six "Priority Communities" in the Bay Area that have relatively higher health impacts and more sensitive populations than many other Bay Area communities. The District is pursuing multiple mitigation measures (e.g. grants, incentives, land use guidance, and regulations) to reduce health impacts related to air pollution in these Priority Communities. However, there are numerous other areas in the Bay Area that have problems similar to those in the Priority Communities, and the various maps developed through the CARE program show that levels of air toxic emissions similar to those in CARE communities are found along freeways throughout the Bay Area.

Data indicate that stationary source contributions to health impacts in Priority Communities are generally small compared to impacts from mobile sources. Nevertheless, the District has committed to tracking emission increases and reductions in order to evaluate cumulative impacts in each priority community, and is planning regulations to mitigate risk from specific source categories (e.g., steel foundries and metal melting).

Proposed Amendments to Air Toxics NSR Program:

Through this rule development project, the District seeks to address air pollution health impacts in CARE Priority Communities. The goals of the project are: (a) to provide an additional margin of public health safety for children and residential receptors, and (b) to increase conformity with the State HRA guidelines.

The proposed revisions to Regulation 2, Rule 5 and the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines include the following:

- The District will implement Age Sensitivity Factors (ASFs) that were adopted by OEHHA on June 1, 2009 by incorporating them into cancer risk estimate procedures. Age Sensitivity Factors were developed to account for inherent increased susceptibility to carcinogens during infancy and childhood. ASFs are used to estimate cancer risk as follows: (1) a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and (2) a factor of 3 for exposures that occur from 2 years through 15 years of age. OEHHA has indicated that revisions to the Exposure Assessment and Stochastic Analysis Technical Support Document are expected to be adopted in mid-2010. These changes in exposure assessment methodology, when combined with ASFs, may increase estimates of residential cancer risk by a factor of 2 to 3 relative to existing procedures.
- Table 2-5-1 will be updated by incorporating the revised health effects values that have been adopted by OEHHA as of June 1, 2009. The specific changes to this table include: a new cancer potency factor for ethyl benzene, a chronic reference exposure level (REL) for silica (crystalline, respirable) and sulfur trioxide, an acute REL for acetaldehyde, the amendment of RELs for acetaldehyde, acrolein, arsenic, formaldehyde, manganese, and mercury. Also, several compounds will be removed from Table 2-5-1 based on deletion of old CAPCOA chronic RELs and USEPA RfCs (OEHHA adopted new risk assessment guidelines that update and replace CAPCOA's Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993). Emission trigger levels have been adjusted considering changes to health effect values and the new ASFs.
- The District will develop a new tracking program for toxic emissions increases and reductions that will be used to assess cumulative impacts in Priority Communities (see the CARE program discussion below).

In order to achieve its goal of addressing air pollution health impacts in Priority Communities, the District originally proposed adding more stringent health risk standards to Rule 2-5, but only for Priority Communities. This proposal would have increased the stringency of the program by a factor of two, but only in those communities. A workshop was held on July 30, 2009 to discuss the proposal. Although there was some support for the proposal, the District received numerous comments pointing out that the proposal might lead to unintended consequences by discouraging Priority Community improvements that could have health benefits. There was also concern that the proposal was inequitable because though there are other Bay Area communities with the same problems and air pollution impacts as the Priority Communities, the residents of those communities would not receive the same level of protection as residents of Priority Communities.

In response to these comments, the District decided to focus on changes in the risk assessment methodology that would provide additional protections for all Bay Area residents. The current proposal would implement Age Sensitivity Factors District-wide, and update the rule to include other HRA guideline changes upon OEHHA

adoption. The proposal would increase the stringency of the program by a factor of two to three for all Bay Area residents.

2. Background

2.1 Introduction

Over the last several decades, public concern about air pollution has expanded from what is typically called "smog" and other criteria air pollutants (so called because they are regulated by first developing health-based criteria as the basis for setting permissible ambient air quality standards) to include toxic air contaminants (TACs). A pollutant is considered toxic if it has the potential to cause adverse health effects such as cancer, birth defects, respiratory ailments, or other serious illness.

For the last twenty-two years, the District's Air Toxics Program has sought to evaluate and reduce the public's exposure to TACs through the control of emissions from stationary sources. The District's Air Toxics Program, along with other programs in place at the State and national level, has significantly reduced ambient exposure to TACs from stationary sources, motor vehicles, fuels, and consumer products. Reformulated fuel and vapor recovery regulations have reduced concentrations of benzene and 1,3-butadiene. MTBE has been eliminated from gasoline. Hexavalent chromium was prohibited in cooling towers and limited in chrome plating facilities. Perchloroethylene has been reduced dramatically (95%) as a result of state and BAAQMD dry cleaning rules. Cleaner-burning diesel engines and cleaner diesel fuel have reduced diesel particulate matter concentrations by 70%.

Figures 2a, 2b, and 2c illustrate significant reductions in the exposure to diesel PM, benzene, and perchloroethylene in the Bay Area over the last two decades. Dr. David Fairley, District Statistician, provides analysis about exposure to these and additional toxic substances in Appendix D ("Ambient Toxics Trends", October 2009). Future toxic emission reductions mandated by the pending phase-out of perchloroethylene dry cleaners, multiple diesel regulations, and other local, state and federal toxics regulations will provide a continuation of these downward trends in toxic exposure; for example, pending regulatory standards are anticipated to reduce diesel PM concentrations by an additional 80% by 2020.

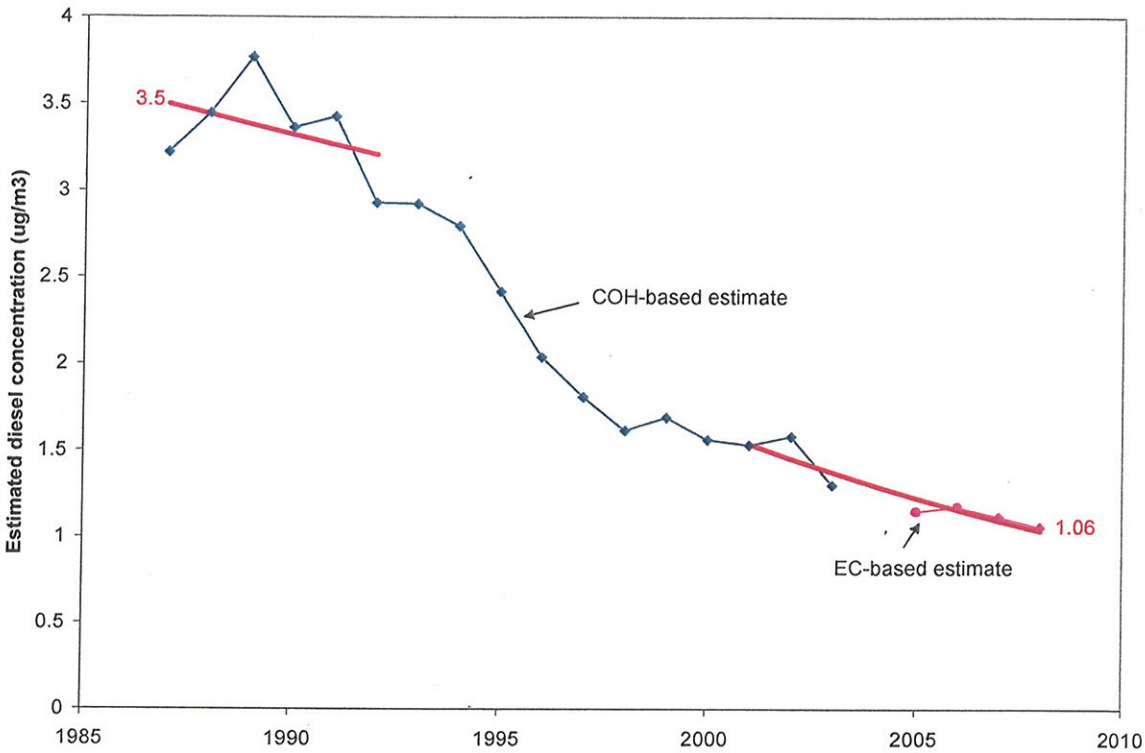

Figure 2a. Estimated diesel particulate matter (PM) concentration trend using Coefficient of Haze (COH) and Elemental Carbon (EC) measurements.

Notes: Values for 1987-2003 are based on the trimmed COH mean of seven sites, using the formula: diesel = .854*COH+.275. Values for 2005-2008 are based on mean EC at 9 sites, with the assumption diesel = EC. The red lines are regression lines to estimate the 1987 and 2008 expected diesel concentrations.

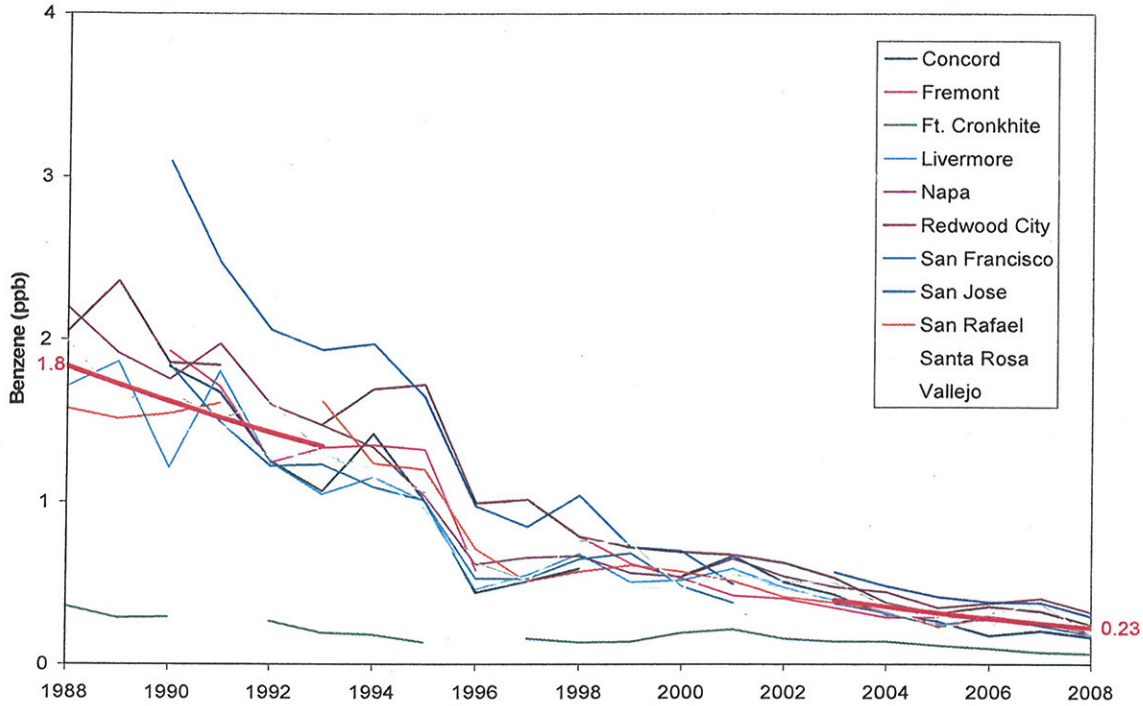

Figure 2b. Annual benzene concentrations at Bay Area sites.

Note: Thick red lines are regression lines to estimate 1988 & 2008 expected benzene concentrations.

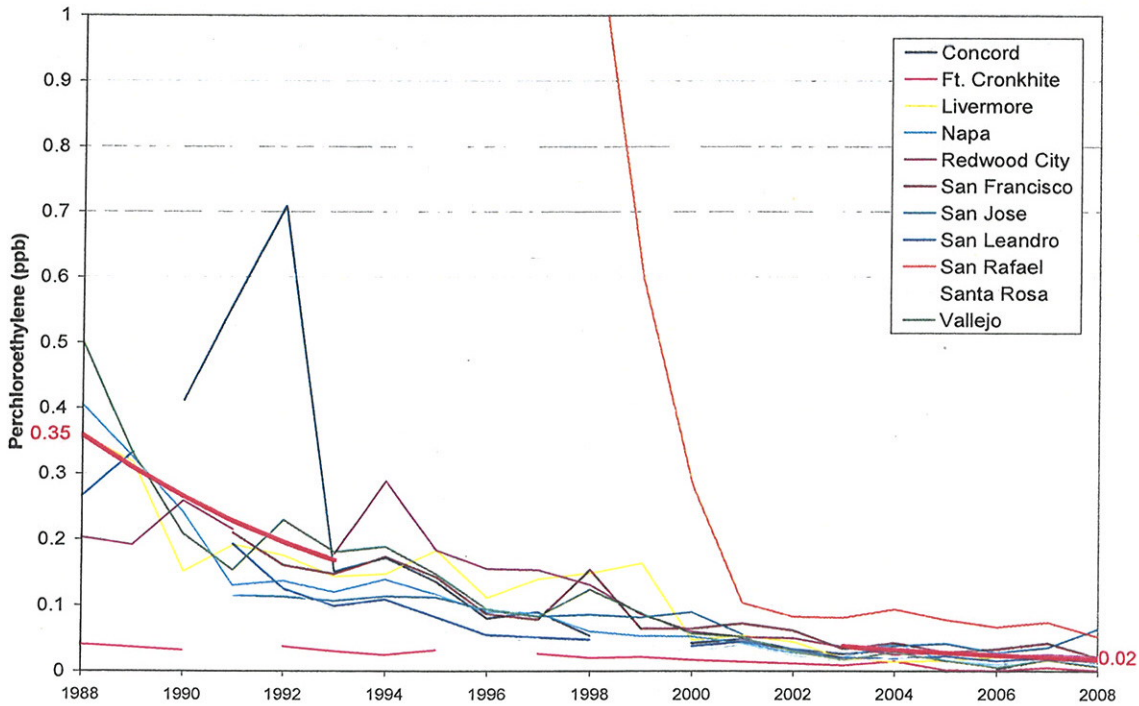

Figure 2c. Annual perchloroethylene concentrations at Bay Area sites.

Note: Not shown were San Rafael values that were > 1 ppb for 1987-1997. Thick red lines are regression lines to estimate the average perchloroethylene concentrations for 1988 & 2008. Significant reductions in Concord (1993) and San Rafael (1998-2001) were related to shutdowns of Perc dry cleaning machines that were located in very close proximity to the monitoring stations.

Figure 2d shows a comparison of the lifetime residential cancer risk estimates based on ambient air monitoring data in the Bay Area. These data indicate a reduction in cancer risk for TACs of about 70% over the last two decades. Pending regulatory standards are anticipated to further reduce cancer risk by over 60% over the next decade.

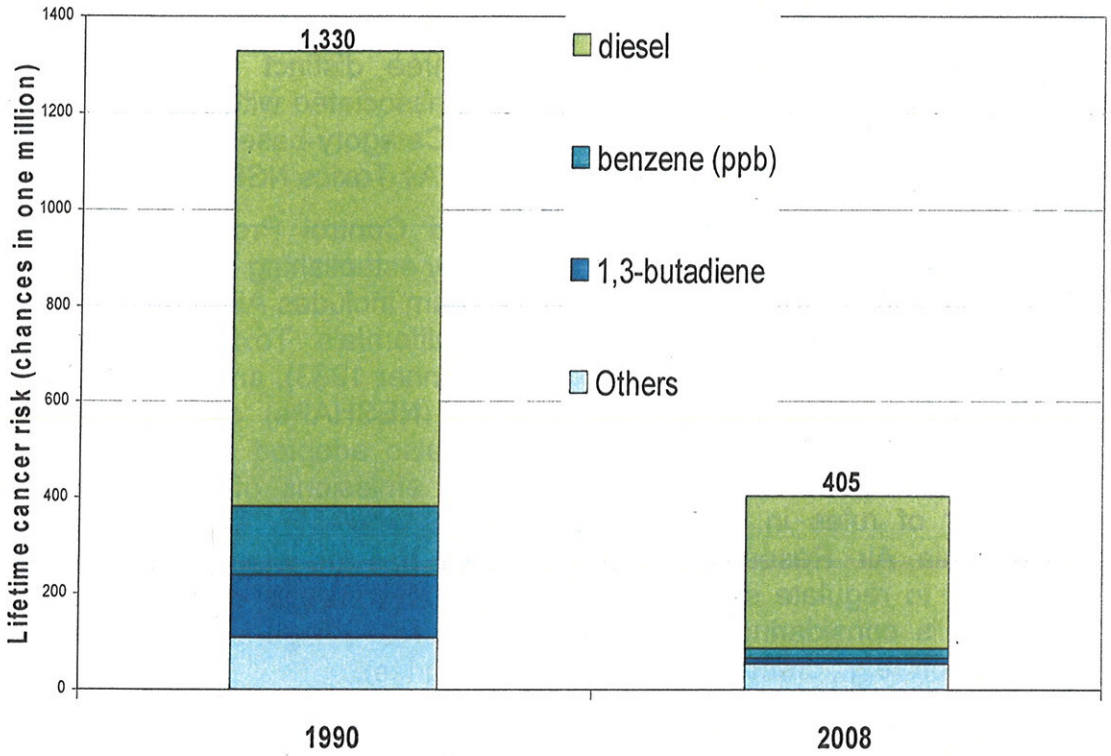

Figure 2d. Trend of lifetime residential cancer risk for Toxic Air Contaminants in the Bay Area.

Note: Risk is based on average ambient air monitoring data and October 2003 OEHHA HRA guideline methodology.

In addition to the District's Air Toxics Program for stationary sources, the District promotes measures directed at reducing emissions from motor vehicles, which are the largest source of TACs. In 2004, the District initiated the Community Air Risk Evaluation (CARE) Program to investigate the cumulative impact of stationary, area, and mobile sources at a neighborhood-level. These investigations have confirmed that motor vehicle emissions, especially emissions of diesel PM, are the largest contributor to neighborhood-level health impacts from air pollution. The CARE Program identified a number of Bay Area communities that have comparatively high air pollution related health impacts and designated six "Priority Communities" on which the District should focus risk reduction efforts.

The District is pursuing multiple mitigation measures (e.g., grants, incentives, land use guidance, rules, and regulations) to reduce the health impacts in these Priority Communities. Although, stationary source contributions to air pollution health impacts in Priority Communities are generally small compared to impacts from mobile sources, the District is considering revisions to several stationary source air toxics programs that will require additional mitigation measures for stationary sources located in these Priority Communities.

2.2 The District Air Toxics Program

The District's Air Toxics Program includes three distinct but complementary regulatory programs that reduce the health risks associated with exposure to TACs emitted from stationary sources: (1) a Source Category-based Control Program, (2) the Air Toxic "Hot Spots" Program, and (3) the Air Toxics NSR Program.

1. The goal of the Source Category-based Control Program is to reduce emissions from new and existing sources by establishing control measures for specific types of toxic sources. This program includes Airborne Toxic Control Measures (ATCMs) originating from California's Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983), and National Emission Standards for Hazardous Air Pollutants (NESHAPs) originating from the federal Clean Air Act. The District has also adopted a number of locally developed control measures that reduce emissions of TACs, including a number of rules in District Regulations 8 and 11. In recent years, the California Air Resources Board (CARB) has adopted several statewide ATCMs to regulate stationary, portable, and vehicular diesel engines. The District is considering several specific source categories for potential new regulation (e.g., crematories and steel foundries).
2. The Air Toxics "Hot Spots" (ATHS) Program was established with the adoption of the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987). The ATHS Program requires facilities to establish and update TAC air emissions inventories. The District then prioritizes these facilities based on the quantity and toxicity of emissions, and the proximity of the facility to potential receptors. High priority facilities are required to prepare facility-wide health risk assessments and, where health risks are determined to be above significance levels established by the District, notification to neighboring populations is required. The ATHS Program was also amended (SB 1731, Calderon 1992) to require facilities that pose a significant health risk to the community to reduce their risk by implementing a risk reduction audit and plan. SB 1731 also requires OEHHA to update the ATHS Health Risk Assessment Guidelines. A number of facilities in the Bay Area voluntarily reduced TAC emissions in order to reduce facility risk below risk thresholds requiring public notification under the ATHS Program. Hundreds of Bay Area dry cleaners that use perchloroethylene were required to implement risk reduction measures under Regulation 11, Rule 16.

3. The goal of the District's Air Toxics NSR Program is to prevent significant increases in health risks resulting from new and modified sources of TACs based on preconstruction permit review. The program is also intended to reduce health risks by requiring updated control requirements when older, more highly polluting, sources are modified or replaced; it is generally more cost-effective to apply stringent air pollution controls to sources at the time of initial construction or modification versus retrofitting. Toxics NSR is designed to allow only de minimus increases in risk, which would limit the potential for significant cumulative risk. Proposed changes to the Air Toxics NSR Program are discussed in detail in Section 3.

2.3 The CARE Program

The Community Air Risk Evaluation (CARE) program was initiated in 2004 to identify Bay Area communities that have both high exposures to toxic air contaminants (TAC) and populations that may be particularly sensitive to the adverse health effects of TAC. The CARE program seeks to implement mitigation measures focused on reducing TAC emissions that affect these impacted communities.

Starting in 2006, the District developed gridded TAC emissions inventories and compiled demographic information that were used to identify Priority Communities for the purposes of distributing grant and incentive funding. In 2009, the District completed regional modeling of TAC emissions to estimate cancer risk and TAC population exposures for the entire District. This health impact information was analyzed and compared to demographic data. Various selection criteria were then used to update and refine the identification of Priority Communities. Appendix C contains a detailed discussion of the TAC inventory and modeling procedures, demographic comparisons, and selection criteria.

Using the methods discussed in Appendix C, the District has identified the following six areas as Priority Communities:

1. Portions of the City of Concord;
2. Western Contra Costa County (including portions of the Cities of Richmond and San Pablo);
3. Western Alameda County along the Interstate-880 corridor (including portions of the Cities of Berkeley, Oakland, San Leandro, San Lorenzo, Hayward;
4. Portions of the City of San Jose;
5. Eastern San Mateo County (including portions of the Cities of Redwood City and East Palo Alto); and
6. Eastern portions of the City of San Francisco.

Maps showing all six Priority Communities in the Bay Area and the boundaries for each priority community are attached in Appendix C.

The proposed changes to the Air Toxics NSR Program will include a tracking system to assess cumulative impacts of TAC emission increases and reductions in the Priority Communities occurring after January 1, 2010. The affected communities are the six areas identified above that have been designated as Priority Communities through the CARE Program. Any future updates to priority community designations will follow the CARE Program designation methods outlined in Appendix C. The District plans to publish these priority community designation guidelines and will periodically update the list of Priority Communities and Guidelines for Designation of Priority Communities. The District will also publish and periodically update a cumulative impact summary report that will describe cumulative impacts of these emission increases and reductions.

3. Proposed Changes to Air Toxics NSR Program

This staff report addresses proposed changes to the Bay Area Air Quality Management District ("the District") Air Toxics New Source Review (NSR) program. The Air Toxics NSR Program has been an important part of the District's air pollution control efforts for the past twenty-two years. The proposed changes in the program will result in amendments to BAAQMD Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants. The District is also proposing to revise the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines and to add new guidelines for designation of Priority Communities. The proposed revisions to Regulation 2 Rule 5 are provided in Appendix A of this report. The proposed revisions to BAAQMD HRSA Guidelines are provided in Appendix B. The new guidelines related to designation of Priority Communities are provided in Appendix C.

3.1 Goals of Proposed Changes to Air Toxics NSR Program

The goals of this proposed rulemaking are:

1. To update the existing District Air Toxics NSR regulation and HRSA guidelines to increase conformity with State health risk assessment guideline revisions that have been adopted by OEHHA since 2005, including Age Sensitivity Factors and new health effects values.
2. To add a tracking provision for emission increases and reductions of toxic air contaminants in order to assess cumulative impacts in Priority Communities.

3.2 Program Updates and Enhancements

The adoption of the proposed revisions to Regulation 2, Rule 5 will update and enhance program requirements and increase conformity with State risk assessment guidelines.

Cal\EPA's Office of Environmental Health Hazard Assessment (OEHHA) is required to develop guidelines for conducting health risk assessments under the Air Toxics Hot Spots Program. In addition to the Air Toxics Hot Spots Program (ATHS), the District also uses these guidelines to conduct health risk assessments under Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants; this consistency is very important because proposed sources authorized by Toxic NSR become existing sources that are subject to the ATHS program.

These heath risk assessment guidelines include the development of risk assessment health values (reference exposure levels (RELs) and cancer potency factors (CPFs)), technical support documents (TSDs) for exposure assessment, and a guidance manual for preparation of health risk assessments. In accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia 731, Statutes of 1999, Health and Safety Code Sections 39669.5 et seq.), OEHHA is currently revising their health risk assessment guidelines to reflect scientific knowledge and techniques developed since their previous guidelines were prepared (in 2003), and in particular to explicitly include consideration of possible differential effects on the health of infants, children and other sensitive subpopulations.

In December 2008, OEHHA finalized and adopted the revised TSD for the development of RELs (a REL is an airborne level of a chemical that is not anticipated to present a significant risk of an adverse non-cancer health effect). In addition to the revised methodology for REL development, the TSD also included revised RELs for six chemicals (acetaldehyde, acrolein, arsenic, formaldehyde, manganese, and mercury). Adoption of the TSD does not automatically affect the other existing RELs. RELs for other toxic air contaminants (TACs) will be revised in the future in accordance with the methodology outlined in the revised TSD for REL development. OEHHA also adopted new 8-hour RELs but has not yet established exposure and risk assessment procedures; when OEHHA adopts the new Exposure Assessment TSD (expected by fall 2010), the District will consider inclusion of these new 8-hour RELs in Regulation 2, Rule 5.

The TSD for CPFs was finalized and adopted in June 2009. OEHHA's revised cancer risk assessment guidelines includes supplemental guidance on children's cancer risk including the use of Age Sensitivity Factors (ASFs) for exposures in infancy and childhood, which are meant to apply to lifetime cancer risk estimates. ASFs address the inherent susceptibility (sensitivity) of the young to carcinogens and the longer period of time that carcinogen exposure to the young has to manifest as cancer. These ASFs would increase lifetime residential cancer risk estimates by 70% by applying the following factors:

- (1) a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age;
- (2) a factor of 3 for exposures that occur from 2 years through 15 years of age; and
- (3) a factor of 1 for exposures that occur from 16 years through 70 years of age.

In addition, OEHHA staff is reviewing many exposure assumptions, including periods of exposure, breathing rates, and noninhalation exposure factors. OEHHA has indicated that revisions to the Exposure Assessment and Stochastic Analysis Technical Support Document are expected to be adopted in mid-2010. OEHHA staff has indicated that these changes in exposure assessment methodology, when combined with ASFs, may increase estimates of residential cancer risk by a factor of 2 to 3 relative to existing procedures. The District plans to implement the revised cancer risk assessment guidelines after OEHHA adopts the new Exposure Assessment TSD.

4. Proposed Rule Amendments

4.1 Proposed Amendments to Regulation 2, Rule 5

The District is proposing to amend Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants. The rule is organized into six sections as follows: General (section numbers in the 100's), Definitions (200's), Standards (300's), Administrative Requirements (400's), Monitoring and Records (500's), and Manual of Procedures (600's). It also includes Table 2-5-1 Toxic Air Contaminant Trigger Levels. A copy of the proposed revisions to this rule is provided in Appendix A of this staff report. The proposed revisions to each section of this rule are discussed below.

4.1.1 General Requirements

The General requirements define the applicability of the rule and identify any exemptions from the rule or from specific sections of the rule. The proposed amendments to the general requirements are as follows.

Section 2-5-111: Exemption, Emergency Standby Engines: The District is adding text to exempt emissions occurring during initial start-up testing of emergency standby engines. Start-up testing may be necessary to demonstrate compliance with emission standards, efficacy of abatement systems, or adequate performance. These emissions are not routine or entirely predictable. Operation of these engines is also limited by provisions of the State ATCM.

4.1.2 Definitions

This section of the rule contains definitions for terms used in this rule. The District is proposing to modify four existing definitions and to add three new definitions to this rule. These definitions are necessary to explain the District's new terms and clarify risk assessment procedures.

Section 2-5-206: Cancer Risk: The District is proposing to add a phrase to this definition to indicate consideration of Age Sensitivity Factors, where appropriate, to account for inherent increased susceptibility to carcinogens during infancy and childhood.

Section 2-5-212: Maximally Exposed Individual, or MEI: The District is proposing to add a sentence to this definition to clarify that MEI locations are determined for each type of health impact (cancer risk, chronic hazard index, and acute hazard index) and for all potential receptors (residential, worker, and student). The highest health impact for any type of receptor is the MEI for that particular health impact. For example, the MEI location for cancer risk may be different than the MEI location for chronic hazard index or the MEI location for acute hazard index.

Section 2-5-216: Project: The District is proposing to clarify that a project involving a modified source may include any contemporaneous risk reduction that occurs at that modified source as a result of the project. From the calculation procedures in Regulation 2-5-601.4, the District already includes emission reductions at a modified source as part of the project. This definition revision makes it clear that any type of contemporaneous risk reduction measure at a modified source may be included as part of the project.

Section 2-5-218: Receptor Location: The District is adding a reference to student receptors.

Section 2-5-225: K-12 School: The proposed definition for a K-12 school is based on the California Health and Safety Code Section 42301.9(a) definition of "school," and is consistent with the definition of a school in Diesel ATCMs. The District plans to use this definition because the District has procedures in place to identify these schools and is currently using this definition for the purpose of satisfying the public noticing requirements for schools (Regulation 2-1-412).

Section 2-5-226: Student Receptor: This section defines the term: "student receptor" and is necessary to clearly identify the applicability of risk limits.

Section 2-5-227: Priority Community: This definition describes the general concept of a priority community, which was developed through the District's CARE Program.

4.1.3 Standards

This section of the rule contains the health risk standards that apply to all new sources, all modified sources, and all projects. The District is not proposing any revision of this section.

4.1.4 Administrative Requirements

This section of the rule identifies various administrative requirements that are necessary for the District to determine compliance with this rule. These administrative requirements include various guidelines and other publications related to this rule that the District must periodically update.

Sections 2-5-404: Designation of Priority Communities: The District is adding a requirement for the APCO to publish and update a list of the designated Priority Communities. The designation procedures and selection criteria were initially developed through the District's CARE program; they are documented and will be periodically updated in the District's Guidelines for Designation of Priority Communities.

Sections 2-5-405: Cumulative Impact Summary for Priority Communities: The District is adding a requirement for the APCO to publish and update a cumulative impact summary report. For each priority community, the District will track all toxic emission increases and reductions occurring after January 1, 2010 and will periodically evaluate the cumulative impact for each priority community.

4.1.5 Monitoring and Records

The District is not proposing any changes to this section of the rule.

4.1.6 Manual of Procedures

This section of the rule identifies various procedures that must be followed when demonstrating compliance with the standards in this rule. The District is proposing revisions to these sections to clarify existing procedures and to explain the toxicity weighted emission calculation procedures, which will be used for tracking health impact changes in Priority Communities.

Section 2-5-601: Emission Calculation Procedures: In Section 601.3.2, the District is clarifying that emission calculations shall be based on all emission increases resulting from all modifications of a source occurring after January 1, 1987. This clarification is consistent with the definition of a project (Section 2-5-216).

Section 2-5-604: Calculation Procedures for Toxicity Weighted Emissions: This section explains how the cancer potency (CP) weighting factors and chronic REL (CREL) weighting factors listed in Table 2-5-1 should be used in order to determine toxicitiy weighted emission reductions and toxicity weighted emission increases.

4.1.7 Table 2-5-1

Toxic Air Contaminant Trigger Levels:

The proposed TAC trigger levels presented in Table 2-5-1 are used to determine the need for a health risk screening analysis (HRSA) for projects involving new and modified sources. The proposed TAC trigger levels are also used: (1) to establish permit requirements for certain sources that may otherwise qualify for permit exemptions, (2) as part of the applicability of the accelerated permit program, and (3) in determining permit fees. The proposed TAC trigger levels are considered to be reasonable de minimus emission rates for use at a project-level. Projects with emissions below the TAC trigger levels are unlikely to cause, or contribute significantly to, adverse health risks.

The proposed TAC trigger levels were calculated using: (1) target health risk levels that are considered de minimus for project-level risks; (2) OEHHA health effect values; (3) generally conservative modeling procedures that establish the extent to which a TAC is transported and dispersed in the atmosphere after it is emitted from the source; and (4) health-protective assumptions regarding the extent of an individual's response to an emitted TAC, including the new Age Sensitivity Factors.

Target Health Risk Levels:

For chronic health risk, a lifetime cancer risk of 1.0 in a million (1.0×10^{-6}) and a non-cancer hazard index of 0.2 are used as the target health risk levels to derive the chronic trigger levels; these are the risk thresholds at which TBACT is required (Section 2-5-301). For acute health risk, a hazard index of 1.0 is used as the target health risk level, which is the same as the acute non-cancer hazard index limit for projects (Section 2-5-302.3).

Health Effects Values:

The proposed Table 2-5-1 incorporates the most recent health effects values adopted by OEHHA (through June 2009) for use in the ATHS Program. Revisions in health effects values (other than 8-hour RELs) adopted between January 1, 2005 and June 1, 2009 are reflected in the proposed Table 2-5-1. OEHHA has adopted 8-hour RELs for some compounds; however, the District is not proposing to add these 8-hour RELs to Table 2-5-1 at this time, because the risk assessment guidance procedures that would use these 8-hour RELs are not complete. Table 4.1.7-1 identifies the new and revised health effects values that are being incorporated into Table 2-5-1.

OEHHA has developed and adopted new risk assessment guidelines that update and replace CAPCOA's Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines (October 1993). OEHHA has deleted old CAPCOA chronic RELs and USEPA RfCs for many chemicals. The District is revising Table 2-5-1 to incorporate these chronic REL deletions. Table 4.1.7-2 identifies chemicals for which the chronic REL is being deleted, but which will remain in Table 2-5-1 due to other established health effects values. Table 4.1.7-3 identifies the chemicals that will be removed from Table 2-5-1 because their chronic RELs are being deleted and these chemicals have no other established health effects values.

Weighting Factors:

For purposes of calculating toxicity weighted emissions, chronic reference exposure level (CREL) and cancer potency (CP) weighting factors were added to Table 2-5-1. These factors were developed assuming multi-pathway exposure where applicable, and continuously operating sources for residential receptor exposure.

Table 4.1.7-1 New and Revised Health Effects Values for Table 2-5-1

Chemical	Acute Inhalation REL ($\mu g/m^3$)	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-day)	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$
Acetaldehyde	4.7E+02	1.4E+02 ~~9.0E+00~~		1.0E-02
Acrolein	2.5E+00 ~~1.9E-01~~	3.5E-01 ~~6.0E-02~~		
Arsenic and compounds (inorganic)	2.0E-01 ~~1.9E-01~~	1.5E-02 ~~3.0E-02~~	3.5E-06 ~~3.0E-04~~	1.2E+01
Arsine	2.0E-01 ~~1.6E+02~~	1.5E-02 ~~5.0E-02~~		
Ethylbenzene		2.0E+03		8.7E-03
Formaldehyde	5.5E+01 ~~9.4E+01~~	9.0E+00 ~~3.0E+00~~		2.1E-02
Manganese		9.0E-02 ~~2.0E-01~~		
Mercury and compounds (inorganic)	6.0E-01 ~~1.8E+00~~	3.0E-02 ~~9.0E-02~~	1.6E-04 ~~3.0E-04~~	
Mercuric chloride	6.0E-01 ~~1.8E+00~~	3.0E-02 ~~9.0E-02~~	1.6E-04 ~~3.0E-04~~	
Silica (crystalline, respirable)		3.0E+00		
Sulfur trioxide	1.2E+02	1.0E+00		

Table 4.1.7-2 Chemicals for which the Chronic REL was deleted in Table 2-5-1

Acrylamide
Acrylic acid
Allyl chloride
Aniline
Benzidine (and its salts)
benzidine based dyes
direct black 38
direct blue 6
direct brown (technical grade)
Benzyl chloride
Copper and compounds
Dibromo-3-chloropropane, 1,2-(DBCP)
Di(2-ethylhexyl)phthalate (DEHP)
Ethylene glycol butyl ether – EGBE (2-butoxy ethanol; butyl cellosolve)
Hexachlorobenzene
Hexachlorocyclohexanes (mixed or technical grade)
Hexachlorocyclohexane, alpha-
Hexachlorocyclohexane, beta-
Hexachlorocyclohexane, gamma- (lindane)
Methyl ethyl ketone (MEK) (2-butanone)
Ozone
Pentachlorophenol
PCBs (polychlorinated biphenyls)
Sodium Hydroxide
Sulfates
Vinyl chloride

Table 4.1.7-3 Chemicals Removed from Table 2-5-1

Antimony compounds
Antimony trioxide
Bromine and compounds
bromine pentafluoride
hydrogen bromide
2-Chloroacetophenone
Chlorodifluoromethane (Freon 22)
Chlorofluorocarbons
2-Chlorophenol
Chloroprene
Ethyl acrylate
Fluorocarbons (chlorinated)
chlorinated fluorocarbon (CFC-113)
chlorodifluoromethane (Freon 22)
dichlorofluoromethane (Freon 21)
trichlorofluoromethane (Freon 11)
fluorocarbons (brominated)
Freons
Hexachlorocyclopentadiene
Methyl mercury
Methyl methacrylate
Mineral fibers (<1% free silica)
ceramic fibers (man made)
glasswool (man made fibers)
mineral fibers (fine: man made)
rockwool (man made fibers)
slagwool (man made fibers)
Nitrobenzene
2-Nitropropane
Phosphorus (white)
Tetrachlorophenols
Vinyl bromide
Zinc and compounds
zinc oxide

4.2 Proposed Revisions to HRSA Guidelines

The District is proposing to revise the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines. A copy of the proposed revisions to the HRSA guidelines is provided in Appendix B of this staff report.

The HRSA guidelines now reference State risk assessment and risk management guidelines in effect as of June 1, 2009, including The Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustments to Allow for Early Life Stage Exposures (OEHHA, May 2009) and The Technical Support Document for the Derivation of Noncancer Reference Exposure Levels (OEHHA, December 2008). The list of reference documents has been updated.

A note was added to clarify that the District will not implement the new 8-hour RELs (adopted by OEHHA in December 2008) until the new exposure TSD is adopted by OEHHA.

A new section (2.3 Cancer Risk Calculations) was added to describe the procedure for calculating cancer risk using Cancer Potency Factors and incorporating the new Age Sensitivity Factors into Cancer Risk Adjustment Factors (e.g., 1.7 for lifetime residential cancer risk). Cancer risk for off-site workers would not be adjusted.

The equation for calculating cancer risk is:

*Cancer Risk = Dose * Cancer Potency Factor * Cancer Risk Adjustment Factor*

5. Socioeconomic Impacts

Section 40728.5 of the California Health and Safety Code requires state air districts to assess the socioeconomic impacts of the adoption, amendment or repeal of a rule if the rule is one that "will significantly affect air quality or emissions limitations." Applied Development Economics, Inc. of Walnut Creek, California has prepared a socioeconomic analysis (see Appendix G) of the proposed amendments to Regulation 2, Rule 5. District staff has reviewed and accepted this analysis.

The analysis concludes that businesses "...subject to proposed changes to Rule 2-5 and the HRSA guidelines are not impacted significantly across the board." and that "...small businesses are not disproportionately impacted."

Staff notes that some new gasoline dispensing facilities (GDFs), which are already required by CARB regulation to use Best Available Control Technology (enhanced vapor recovery), do not have the option to apply additional controls and may be restricted by the amount of authorized sales or the location of the business. The more restrictive risk assessment changes would also prevent some existing GDFs from increasing their permitted throughput. Table 4.1.7-4 shows the approximate cancer risk from average GDFs (2.2 million gallons/yr) in Oakland and San Jose. Note that locating a GDF in close proximity to a residential receptor could create an excessive risk; relocation would be advised. A station with greater sales may need a larger buffer zone.

Table 4.1.7-4 Cancer Risk Estimates for Average Gasoline Station

Oakland

Distance from station centroid (meters)	Cancer Risk (in a million) current guidelines	Cancer Risk (in a million) using ASFs	Cancer Risk (in a million) w/ factor of 3
25	5.1	8.6	15.2
50	2.1	3.6	6.4
75	1.2	2.1	3.7
100	0.8	1.4	2.4
125	0.6	1.0	1.7
150	0.4	0.7	1.3
175	0.3	0.6	1.0
200	0.3	0.5	0.8
225	0.2	0.4	0.7
250	0.1	0.2	0.3

San Jose

Distance from station centroid (meters)	Cancer Risk (in a million) current guidelines	Cancer Risk (in a million) using ASFs	Cancer Risk (in a million) w/ factor of 3
25	7.6	12.9	22.7
50	3.0	5.1	9.1
75	1.7	2.8	5.0
100	1.1	1.8	3.2
125	0.7	1.3	2.2
150	0.6	0.9	1.7
175	0.4	0.7	1.3
200	0.3	0.6	1.0
225	0.3	0.5	0.9
250	0.2	0.4	0.7

Note: The average Bay Area gasoline dispensing facility sells 2.2 million gallons of gasoline per year. Column two indicates residential cancer risk estimates using current procedures; column three indicates residential cancer risk estimates using proposed procedures including Age Sensitivity Factors (increases residential cancer risk estimates by a factor of 1.7), and column four indicates residential cancer risk using a factor of 3 (estimated by OEHHA to represent the potential increase in cancer risk estimates related to future revisions to the HRA guidelines). Risk was calculated for a GDF with four pump islands using ISCST3 air dispersion model and meteorological data from Oakland Airport and San Jose Airport.

6. District Impacts

The proposed amendments are expected to have a measurable impact on District resources, primarily in the Engineering Division. The implementation of new health effect values, new trigger levels, and new cancer estimation factors (Age Sensitivity Factors) will require more Health Risk Screening Analyses and more refinement of many of these analyses. The tracking of toxic emission increases and reductions in the Priority Communities will also require more resources in the Engineering and Planning Divisions. It is anticipated that implementation of the District's new Production System (database) in 2010 will provide efficiencies to partially mitigate this increased demand for resources.

7. REGULATORY IMPACTS

Section 40727.2 of the Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal, state, or air district's air pollution control requirements that apply to the same equipment or source type affected by the proposed change in air district rules. The air district must also identify any state or other air pollution control requirements and guidelines that will apply to the same equipment or source type and of which the air district has been informed pursuant to the statute. The air district must then note any difference between these existing requirements and the requirements imposed by the proposed change.

There are currently no federal or state new source review regulations specific for toxic compounds. State ATCMs and federal NESHAPS regulate some of the same type of stationary sources (e.g., diesel engines, gasoline stations); however the District would apply these state and federal standards during the permit evaluation. Regulation 2-5-301 requires TBACT at certain risk levels; TBACT would be at least as stringent as state and federal requirements – indeed, CARB has often stated that ATCM standards are TBACT and the District generally agrees but occasionally establishes TBACT for particular sources that are more stringent than ATCM standards.

8. ENVIRONMENTAL IMPACTS

Pursuant to the California Environmental Quality Act, the District has had an initial study prepared by Environmental Audit, Inc. of Placentia, California for the proposed amendments to Regulation 2, Rule 5 and to the BAAQMD HRSA Guidelines. The initial study concludes that there are no potential significant adverse environmental impacts associated with these proposed amendments. A negative declaration is proposed for approval by the District Board of Directors. The negative declaration and initial study are available to the public for comment (see Appendix F).

9. RULE DEVELOPMENT / PUBLIC PROCESS

The District originally proposed adding more stringent health risk standards in Priority Communities to Regulation 2, Rule 5, and a workshop was held on July 30, 2009 to discuss the proposal.

Comments received include:

- Business stakeholders and the City of San Jose stated strong opposition to the proposal to establish more stringent NSR requirements in Priority Communities relative to other parts of the Bay Area; that the proposal was inequitable and may discourage investment in the Priority Communities without providing significant health risk benefits (or perhaps inadvertently increasing health risks and decreased access to health care as a consequence of job losses and other economic impacts to the community from the differentiated requirements).
- Several commenters expressed concern over the selection process for the Priority Communities.
- The City of San Jose supported the health protective goals of the proposal but suggested different methodology that would not conflict with Smart Growth principals and their regional plans for sustainability; the city recommended options, including alternative action plans that would provide more flexibility for affected communities.
- Several people recommended tracking emission reductions in addition to emission increases.
- Several people recommended waiting and implementing changes to the OEHHA HRA guidelines in lieu of more stringent standards for some communities.
- The Bay Area Environmental Health Collaborative (BAEHC) commented that the District's proposal does not go far enough and that permits for new and modified sources should be prohibited in the Priority Communities, unless a proposed project would result in a net onsite reduction in emissions and health risks, or meets an urgent community need.
- The Bay Area Clean Air Task Force (BACATF) commented that the (initial) proposed standard of five in one million is insufficient to limit new pollution and achieve no net increase, and reductions in cumulative health impacts. NSR regulations should state and seek to achieve the goal of reduction in cumulative risk in impacted communities. BACATF urges a standard of no net increase for both the cancer risk and non-cancer risk standards.

In response to the comments received, Staff posted a revised proposal and request for comments on the District Website on October 21, and sent the notice to all parties that had provided comments or participated in the workshop, the CARE program, and the Cumulative Impacts Workgroup.

Staff has received several comments on the revised proposal:

- Tesoro Corporation commented that emission reductions within a project or a previous project should be considered for mitigation of toxic emission increases.
- The Bay Planning Coalition commented that the District was premature in proposing to use Age Sensitivity Factors and recommends that BAAQMD continue to monitor and participate in the efforts brought forward by CARB and OEHHA, but that it not implement the ASFs until the state-wide scientific and regulatory process has been finalized and approved.

Appendix E contains copies of the written comments received by the District and staff responses.

District staff plans to present the proposed amended rule and a Negative Declaration to the Board of Directors at a public hearing on December 16, 2009. A notice of the hearing was posted on the District website on November 13, 2009.

Government Agency Involvement

The District staff has worked closely with staff of OEHHA in the development of the state HRA guidelines, particularly the Age Sensitivity Factors and new/revised health effect values. District toxics staff participates in CAPCOA's Toxics and Risk Managers Committee (TARMAC) and keeps committee members from other districts, CARB, OEHHA, and U.S.EPA apprised of the District air toxics programs, including this proposal.

10. CONCLUSIONS & RECOMMENDATIONS

This report describes proposed revisions to District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants and the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines; includes a proposed Negative Declaration for CEQA, and provides for publication of the Guidelines for Designation of Priority Communities.

Staff concludes that the proposed revisions to District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants and the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines are necessary and health protective.

Staff recommends that the Board adopt the proposed amendments and certify the Negative Declaration.

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix A:

Proposed Regulatory Language

REGULATION 2
PERMITS
RULE 5
NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

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REGULATION 2
PERMITS
RULE 5
NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

Adopted June 15, 2005

2-5-100 GENERAL

2-5-101 Description: The purpose of this rule is to provide for the review of new and modified sources of toxic air contaminant (TAC) emissions in order to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced. The rule applies to a new or modified source of toxic air contaminants that is required to have an authority to construct or permit to operate pursuant to Regulation 2, Rule 1. New and modified sources with Hazardous Air Pollutant emissions may also be subject to the Maximum Achievable Control Technology (MACT) requirement of Regulation 2, Rule 2, Section 317.

2-5-110 Exemption, Low Emission Levels: A source shall not be subject to the provisions of this rule if, for each toxic air contaminant, the increase in emissions from the project is below the trigger levels listed in Table 2-5-1.

2-5-111 Limited Exemption, Emergency Standby Engines: This rule shall not apply to toxic air contaminant emissions occurring from emergency use of emergency standby engines (as defined in Regulation 9, Rule 8, Section 231 or the applicable CARB ATCM); or from initial start-up testing; or from emission testing of emergency standby engines required by the APCO.

2-5-112 Applicability and Circumvention: This rule applies to the following:

112.1 A new or modified source of toxic air contaminants for which an application is submitted on or after July 1, 2005;

112.2 A source of toxic air contaminants constructed or modified after January 1, 1987 for which no authority to construct or permit to operate has been issued by the District and for which the District Rules and Regulations and Risk Management Policy in effect at the time of construction or modification required an authority to construct or permit to operate.

2-5-200 DEFINITIONS

2-5-201 Acute Hazard Index, or Acute HI: Acute hazard index is the sum of the individual acute hazard quotients for toxic air contaminants identified as affecting the same target organ or organ system.

2-5-202 Acute Hazard Quotient, or Acute HQ: Acute hazard quotient is the ratio of the estimated short-term average concentration of the toxic air contaminant to its acute reference exposure level (estimated for inhalation exposure).

2-5-203 Airborne Toxic Control Measure, or ATCM: A recommended method and, where appropriate, a range of methods, established by the California Air Resources Board (CARB) pursuant to the Tanner Act, California Health and Safety Code beginning at Section 39650, that reduces, avoids, or eliminates the emissions of a toxic air contaminant.

2-5-204 Air Toxics Hot Spots Program: The Air Toxics “Hot Spots” Information and Assessment Act of 1987, California Health and Safety Code beginning at Section 44300.

2-5-205 **Best Available Control Technology for Toxics, or TBACT:** For any new or modified source of toxic air contaminants, except cargo carriers, the most stringent of the following emission controls, provided that under no circumstances shall the controls be less stringent than the emission control required by any applicable provision of federal, State or District laws, rules, regulations or requirements:

205.1 The most effective emission control device or technique which has been successfully utilized for the type of equipment comprising such a source; or

205.2 The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or

205.3 Any control device or technique or any emission limitation that the APCO has determined to be technologically feasible for the type of equipment comprising such a source, while taking into consideration the cost of achieving emission reductions, any non-air quality health and environmental impacts, and energy requirements; or

205.4 The most stringent emission control for a source type or category specified as MACT by U.S. EPA, or specified in an ATCM by CARB.

2-5-206 **Cancer Risk:** An estimate of the probability that an individual will develop cancer as a result of lifetime exposure to emitted carcinogens at a given receptor location, and considering, where appropriate, Age Sensitivity Factors to account for inherent increased susceptibility to carcinogens during infancy and childhood,

2-5-207 **Carcinogen:** For the purpose of this rule, a carcinogen is any compound for which Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) has established a cancer potency factor for use in the Air Toxics Hot Spots Program.

2-5-208 **Chronic Hazard Index, or Chronic HI:** Chronic hazard index is the sum of the individual chronic hazard quotients for toxic air contaminants identified as affecting the same target organ or organ system.

2-5-209 **Chronic Hazard Quotient, or Chronic HQ:** Chronic hazard quotient is the ratio of the estimated annual average exposure of the toxic air contaminant to its chronic reference exposure level (estimated for inhalation and non-inhalation exposures).

2-5-210 **Health Risk:** The potential for adverse human health effects resulting from exposure to emissions of toxic air contaminants and ranging from relatively mild temporary conditions, such as eye or throat irritation, shortness of breath, or headaches, to permanent and serious conditions, such as birth defects, cancer or damage to lungs, nerves, liver, heart, or other organs. Measures of health risk include cancer risk, chronic hazard index, and acute hazard index.

2-5-211 **Health Risk Screening Analysis, or HRSA:** An analysis that estimates the increased likelihood of health risk for individuals in the affected population that may be exposed to emissions of one or more toxic air contaminants, determined in accordance with Section 2-5-603.

2-5-212 **Maximally Exposed Individual, or MEI:** A person that may be located at the receptor location where the highest exposure to toxic air contaminants emitted from a given source or project is predicted, as shown by an APCO-approved HRSA. MEI locations are typically determined for maximum cancer risk, chronic hazard index and acute hazard index based on exposure to residential, worker, and student receptors.

2-5-213 **Maximum Achievable Control Technology, or MACT:** An emission standard promulgated by U.S. EPA pursuant to Section 112(d) of the Clean Air Act.

2-5-214 **Modified Source of Toxic Air Contaminants:** An existing source that undergoes a physical change, change in method of operation, or increase in throughput or production that results or may result in any of the following:

214.1 An increase in the daily or annual emission level of any toxic air contaminant, or the production rate or capacity that is used to estimate toxic air contaminant emission levels, above emission or production levels approved by the District in any authority to construct.

214.2 An increase in the daily or annual emission level of any toxic air contaminant, or the production rate or capacity that is used to estimate toxic air contaminant

emission levels, above levels contained in a permit condition in any current permit to operate or major facility review permit.

214.3 For a source that has never been issued a District authority to construct and that does not have conditions limiting daily or annual toxic air contaminant emissions, an increase in the daily or annual emission level of any toxic air contaminant, or the production rate or capacity that is used to estimate the emission level, above the lower of the authorized capacity as established pursuant to Section 2-5-214.3.1 or the functional capacity as established pursuant to 2-5-214.3.2:

3.1 The authorized capacity is the highest of the following:

3.1.1 The highest attainable design capacity, as shown in pre-construction design drawings, including process design drawings and vendor specifications.

3.1.2 The capacity listed in the District permit to operate.

3.1.3 The highest documented actual levels attained by the source prior to July 1, 2005.

3.2 The functional capacity is the capacity of the source as limited by the capacity of any upstream or downstream process that acts as a bottleneck (a grandfathered source with an emission increase due to debottlenecking is considered to be modified).

For the purposes of applying Section 2-5-214.3, only increases in annual emission levels shall be considered for storage vessels.

214.4 The emission of any toxic air contaminant not previously emitted in a quantity that would result in a cancer risk greater than 1.0 in a million (10^{-6}) or a chronic hazard index greater than 0.20.

For the purposes of applying this definition, a daily capacity may be converted to an annual capacity or limit by multiplication by 365 days/year.

2-5-215 **New Source of Toxic Air Contaminants:** A source of toxic air contaminant emissions, except a source that loses a permit exemption or exclusion in accordance with Regulations 2-1-424 or 2-1-425, that is one or more of the following:

215.1 A source constructed or proposed to be constructed that never had a valid District authority to construct or permit to operate.

215.2 A source that has not been in operation for a period of one year or more and that has not held a valid District permit to operate during this period of non-operation.

215.3 A relocation of an existing source, except for a portable source, to a non-contiguous property.

215.4 A replacement of a source, including an identical replacement of a source, regardless when the original source was constructed.

215.5 A replacement of an identifiable source within a group of sources permitted together under a single source number for the purpose of District permitting convenience.

215.6 A “rebricking” of a glass furnace where changes to the furnace design result in a change in heat generation or absorption.

2-5-216 **Project:** Any source, or group of sources, at a facility that: (a) is part of a proposed construction or modification, (b) is subject to the requirements of Regulation 2-1-301 or 302, and (c) emits one or more toxic air contaminants. All new or modified sources of TACs included in a single permit application will be considered as a project. In addition, in order to discourage circumvention that might be achieved by breaking a project into smaller pieces and submitting more than one permit application over a period of time, a project shall include those new or modified sources of TACs at a facility that have been permitted within the two-year period immediately preceding the date a complete application is received, unless the applicant demonstrates to the satisfaction of the APCO that construction or modification of the sources included in the current application was neither (1) a reasonably foreseeable consequence of the previous project, nor (2) a critical element or integral part of the previous project. For modified sources, any consecutive modifications of a source (e.g., increasing a source's permitted throughput), occurring after January 1, 1987, shall be considered together as a project. Any contemporaneous emission reduction proposed for a modified source, as set forth in Section 2-5-601.4, shall be considered as part of a project.

2-5-217 **Project Risk:** The health risk resulting from the increase in emissions of toxic air contaminants from a given project, as indicated by an HRSA for the MEI.

2-5-218 **Receptor Location:** A location where an individual may live (residential receptor) or work (worker receptor) or otherwise reasonably be expected to be exposed (e.g., student receptor) to toxic air contaminants for the particular chronic or acute exposures being evaluated in an HRSA. Locations include (a) locations outside of the property boundary of the facility being evaluated and (b) locations inside the property boundary where a person may reside (e.g., at military base housing, prisons, or universities). The APCO shall consider the potential for public exposure in determining appropriate receptor locations.

2-5-219 **Reference Exposure Level, or REL:** The air concentration or exposure level (for a specified exposure duration) at or below which adverse non-cancer health effects are not anticipated to occur in the general human population.

2-5-220 **Residential Receptor:** Any receptor location where an individual may reside for a period of six months or more out of a year.

2-5-221 **Source Risk:** The health risk resulting from: (a) the emissions of all toxic air contaminants from a new source of toxic air contaminants, or (b) the increase in emissions of all toxic air contaminants from a modified source of toxic air contaminants, as indicated by an HRSA for the MEI.

2-5-222 **Toxic Air Contaminant, or TAC:** An air pollutant that may cause or contribute to an increase in mortality or in serious illness or that may pose a present or potential hazard to human health. For the purposes of this rule, TACs consist of the substances listed in Table 2-5-1.

2-5-223 **Trigger Level:** The emission threshold level for each TAC listed in Table 2-5-1 below which the resulting health risks are not expected to cause, or contribute significantly to, adverse health effects.

2-5-224 **Worker Receptor:** Any receptor location that is an occupational setting or place where an individual may work and that is located outside of the boundary of the facility being evaluated.

2-5-225 **K-12 School**: Any public or private school used for purposes of the education of more than 12 children at the school in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes. The term may include any building or structure, playground, athletic field, or other area of school property, but does not include unimproved school property.

2-5-226 **Student Receptor:** A location of a child at a K-12 school.

2-5-227 **Priority Community:** An area, designated by the APCO, where levels of toxic air contaminants are higher than other areas and where people may be particularly vulnerable and may bear disproportionately higher adverse health effects.

2-5-300 STANDARDS

2-5-301 Best Available Control Technology for Toxics (TBACT) Requirement: The applicant shall apply TBACT to any new or modified source of TACs where the source risk is a cancer risk greater than 1.0 in one million (10^{-6}), and/or a chronic hazard index greater than 0.20.

2-5-302 Project Risk Requirement: The APCO shall deny an Authority to Construct or Permit to Operate for any new or modified source of TACs if the project risk exceeds any of the following project risk limits:

302.1 a cancer risk of 10.0 in one million (10^{-5});
302.2 a chronic hazard index of 1.0;
302.3 an acute hazard index of 1.0;

2-5-400 ADMINISTRATIVE REQUIREMENTS

2-5-401 Health Risk Screening Analysis Requirement: An application for an Authority to Construct or Permit to Operate for any project subject to this rule shall contain an HRSA conducted in accordance with Section 2-5-603 or the information necessary for the APCO to conduct an HRSA. The APCO shall prepare an HRSA where the applicant submits none. The APCO shall notify the applicant if the results of an HRSA completed by the APCO indicate that the project, as proposed, would not meet the requirements of this rule. The applicant shall be given the opportunity to perform a more refined HRSA, modify the project, or submit any required plans or information, as necessary to comply with the requirements of this rule.

2-5-402 Health Risk Screening Analysis Guidelines: The APCO shall publish Health Risk Screening Analysis Guidelines that specify the procedures to be followed for estimating health risks including acute hazard index, chronic hazard index, and cancer risk. These guidelines will generally conform to the Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. The Health Risk Screening Analysis Guidelines and Table 2-5-1 will be periodically updated, typically within one year of any significant revision to OEHHA's Health Risk Assessment Guidelines, including any new or revised health effects value.

2-5-403 BACT/TBACT Workbook: The APCO shall publish and periodically update a BACT/TBACT Workbook specifying the requirements for commonly permitted sources. TBACT will be determined for a source by using the workbook as a guidance document or, on a case-by-case basis, using the most stringent definition of Section 2-5-205.

2-5-404 Designation of Priority Communities: The APCO shall publish and periodically update a list of the areas that have been designated as priority communities along with the selection criteria and analyses used in designating these communities.

2-5-405 Cumulative Impact Summary for Priority Communities: The APCO shall publish and periodically update a cumulative impact summary report that describes the cumulative impacts of toxicity weighted emission increases and reductions in each priority community occurring after January 1, 2010.

2-5-500 MONITORING AND RECORDS

2-5-501 Monitoring Requirements: The APCO may impose any reasonable monitoring or record keeping requirements deemed necessary to ensure compliance with this rule.

2-5-600 MANUAL OF PROCEDURES

2-5-601 Emission Calculation Procedures: The APCO shall determine annual TAC emissions (expressed as pounds per year), to be used for comparison with chronic trigger levels and in estimating cancer risk and chronic hazard index, and one-hour TAC emissions (expressed as pounds per hour), to be used for comparison with acute trigger levels and in estimating acute hazard index as follows:

601.1 Emission calculations shall include emissions resulting from routine operation of a source or emissions that are reasonably predictable, including, but not limited to continuous and intermittent releases and predictable process upsets or leaks, subject to enforceable limiting conditions.

601.2 Emission calculations for a new source shall be based on the maximum emitting potential of the new source or the maximum permitted emission level of the new source, approved by the APCO, subject to enforceable limiting conditions.

601.3 Emission calculations for a modified source shall be based on:

3.1 For one-hour emissions, the maximum emitting potential of the modified source or the maximum permitted emission level of the modified source, approved by the APCO, subject to enforceable limiting conditions.

3.2 For annual emissions, the total emission increases resulting from all modifications of a source occurring after January 1, 1987. Emission increases shall be determined by subtracting the adjusted baseline emission rate, as calculated using the methodology in Section 2-5-602, from the new maximum permitted emission level of the modified source, approved by the APCO, subject to enforceable limiting conditions.

601.4 Emission calculations for a project shall be performed by summing the emission increases from all new and modified sources of TACs that are considered part of the project pursuant to Section 2-5-216. For a modified source within the project, the APCO may consider contemporaneous reductions of other emissions from the modified source when estimating the project risk (e.g., a modified source may have a decrease in benzene emissions that would mitigate an increase in toluene emissions).

2-5-602 Baseline Emission Calculation Procedures: The following methodology shall be used to calculate baseline emissions for modified sources of TACs:

602.1 For a source that has, contained in a permit condition, an emission cap or emission rate limit, the baseline throughput and baseline emission rate (expressed in the units of mass of emissions per unit of throughput) shall be based on the levels allowed by the permit condition.

602.2 For sources without an emission cap or emission rate limit, baseline throughput and emission rate shall be determined as follows:

2.1 The baseline period consists of the 3-year period immediately preceding the date that the application is complete (or shorter period if the source is less than 3 years old or longer period if the applicant demonstrates to the District's satisfaction that a longer period is appropriate when considering such factors as operational problems and economic conditions). The applicant must have sufficient verifiable records of the source's operation or credible engineering analyses that substantiate to the District's satisfaction the emission rate and throughput during the entire baseline period.

2.2 Baseline throughput is either the:

2.2.1 Actual average throughput during the baseline period, if throughput is not limited by permit condition; or

2.2.2 Maximum throughput as allowed by permit conditions on the date the application is complete.

2.3 Baseline emission rate (expressed in the units of mass of emissions per unit of throughput) is the average actual emission rate during the baseline period. Periods where the actual emission rate exceeded regulatory or permitted limits shall be excluded from the average.

602.3 The adjusted baseline emission rate shall be determined by adjusting the baseline emission rate downward, if necessary, to comply with the most stringent emission rate or emission limit from a MACT, ATCM, or District rule or regulation that is applicable to the type of source being evaluated and that is in effect, has been adopted by U.S. EPA, CARB, or the District, or is contained in the most recently adopted Clean Air Plan for the District.

602.4 The adjusted baseline emissions shall be the adjusted baseline emission rate multiplied by the baseline throughput.

2-5-603 **Health Risk Screening Analysis Procedures:** Each HRSA shall be prepared following the District's Health Risk Screening Analysis Guidelines.

2-5-604 **Calculation Procedures for Toxicity Weighted Emissions:** Emission increases and reductions shall be determined on a toxicity weighted basis for carcinogens and noncarcinogens. The annual-average emission rate of each carcinogen shall be multiplied by its Cancer Potency (CP) Weighting Factor; the products shall be summed to calculate the total weighted carcinogenic emission rate. The annual-average emission rate of each noncarcinogen shall be divided by its Chronic Reference Exposure Level (CREL) Weighting Factor; the quotients shall be summed to calculate the total weighted noncarcinogenic emission rate. (CP and CREL Weighting Factors are listed in Table 2-5-1.)

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL ($\mu g/m^3$)	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Oral Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Acetaldehyde	75-07-0	4.7E+02	1.4E+02 ~~9.0E+00~~		1.4E+02	1.0E-02		1.0E-02	1.0E+00	3.8E+01 ~~6.4E+01~~
Acetamide	60-35-5					7.0E-02		7.0E-02		5.4E+00 ~~9.1E+00~~
Acrolein	107-02-8	2.5E+00 ~~1.9E-01~~	3.5E-01 ~~6.0E-02~~		3.5E-01				5.5E-03 ~~4.2E-04~~	1.4E+01 ~~2.3E+00~~
Acrylamide	79-06-1		~~7.0E-01~~			4.5E+00		4.5E+00		8.4E-02 ~~1.4E-01~~
Acrylic acid	79-10-7	6.0E+03	~~1.0E+00~~						1.3E+01	~~3.9E+01~~
Acrylonitrile	107-13-1		5.0E+00		5.0E+00	1.0E+00		1.0E+00		3.8E-01 ~~6.4E-01~~
Allyl chloride	107-05-1		~~1.0E+00~~			2.1E-02		2.1E-02		1.8E+01 ~~3.0E+01~~
Aminoanthraquinone, 2-	117-79-3					3.3E-02		3.3E-02		1.1E+01 ~~1.9E+01~~
Ammonia	7664-41-7	3.2E+03	2.0E+02		2.0E+02				7.1E+00	7.7E+03
Aniline	62-53-3		~~1.0E+00~~			5.7E-03		5.7E-03		6.6E+01 ~~3.9E+01~~
~~Antimony compounds~~	~~7440-36-0~~		~~2.0E-01~~							~~7.7E+00~~
~~antimony trioxide~~	~~1309-64-4~~		~~2.0E-01~~							~~7.7E+00~~
Arsenic and compounds (inorganic) [3, 4]	7440-38-2	2.0E-01 ~~1.9E-01~~	1.5E-02 ~~3.0E-02~~	3.5E-06 ~~3.0E-04~~	4.0E-4	1.2E+01	1.5E+00	5.4E+01	4.4E-04 ~~4.2E-04~~	7.2E-03 ~~1.2E-02~~
Arsine	7784-42-1	2.0E-01 ~~1.6E+02~~	1.5E-02 ~~5.0E-02~~		4.0E-4				4.4E-04 ~~3.5E-01~~	5.8E-01 ~~1.9E+00~~
Asbestos [5]	1332-21-4					2.2E+02		2.2E+02		1.7E-03 ~~2.9E-03~~
Benzene [3]	71-43-2	1.3E+03	6.0E+01		6.0E+01	1.0E-01		1.0E-01	2.9E+00	3.8E+00 ~~6.4E+00~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL ($\mu g/m^3$)	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Oral Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Benzidine (and its salts)	92-87-5		~~1.0E+01~~			5.0E+02		5.0E+02		7.6E-04 ~~1.3E-03~~
benzidine based dyes			~~1.0E+01~~			5.0E+02		5.0E+02		7.6E-04 ~~1.3E-03~~
direct black 38	1937-37-7		~~1.0E+01~~			5.0E+02		5.0E+02		7.6E-04 ~~1.3E-03~~
direct blue 6	2602-46-2		~~1.0E+01~~			5.0E+02		5.0E+02		7.6E-04 ~~1.3E-03~~
direct brown 95 (technical grade)	16071-86-6		~~1.0E+01~~			5.0E+02		5.0E+02		7.6E-04 ~~1.3E-03~~
Benzyl chloride	100-44-7	2.4E+02	~~1.2E+01~~			1.7E-01		1.7E-01	5.3E-01	2.2E+00 ~~3.8E+00~~
Beryllium and compounds [4]	7440-41-7		7.0E-03	2.0E-03	7.0E-03	8.4E+00		8.4E+00		4.7E-02 ~~8.0E-02~~
Bis (2-chloroethyl) ether (Dichloroethyl ether)	111-44-4					2.5E+00		2.5E+00		1.5E-01 ~~2.6E-01~~
Bis (chloromethyl) ether	542-88-1					4.6E+01		4.6E+01		8.2E-03 ~~1.4E-02~~
~~Bromine and compounds~~	~~7726-95-6~~		~~1.7E+00~~							~~6.6E+01~~
~~Bromine pentafluoride~~	~~7789-30-2~~		~~1.7E+00~~							~~6.6E+01~~
~~hydrogen bromide~~	~~10035-10-6~~		~~2.4E+01~~							~~9.3E+02~~
~~potassium bromate~~	~~7758-01-2~~		~~1.7E+00~~			~~4.9E-01~~				~~1.3E+00~~
Butadiene, 1,3-	106-99-0		2.0E+01		2.0E+01	6.0E-01		6.0E-01		6.3E-01 ~~1.1E+00~~
Cadmium and compounds [4]	7440-43-9		2.0E-02	5.0E-04	1.8E-02	1.5E+01		1.5E+01		2.6E-02 ~~4.5E-02~~
Carbon disulfide [3]	75-15-0	6.2E+03	8.0E+02		8.0E+02				1.4E+01	3.1E+04

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m^3)	Chronic Inhalation REL (µg/m^3)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Carbon tetrachloride [3] (Tetrachloromethane)	56-23-5	1.9E+03	4.0E+01		4.0E+01	1.5E-01		1.5E-01	4.2E+00	2.5E+00 ~~4.3E+00~~
Chlorinated paraffins	108171-26-2					8.9E-02		8.9E-02		4.2E+00 ~~7.2E+00~~
Chlorine	7782-50-5	2.1E+02	2.0E-01		2.0E-01				4.6E-01	7.7E+00
Chlorine dioxide	10049-04-4		6.0E-01		6.0E-01					2.3E+01
Chloro-o-phenylenediamine, 4-	95-83-0					1.6E-02		1.6E-02		2.4E+01 ~~4.0E+01~~
~~Chloroacetophenone, 2-~~	~~532-27-4~~		~~3.0E-02~~							~~1.2E+00~~
Chlorobenzene	108-90-7		1.0E+03		1.0E+03					3.9E+04
~~Chlorodifluoromethane (Freon 22) [see Fluorocarbons]~~										
~~Chlorofluorocarbons [see Fluorocarbons]~~										
Chloroform [3]	67-66-3	1.5E+02	3.0E+02		3.0E+02	1.9E-02		1.9E-02	3.3E-01	2.0E+01 ~~3.4E+01~~
~~Chlorophenol, 2-~~	~~95-57-8~~		~~1.8E+01~~							~~7.0E+02~~
Chloropicrin	76-06-2	2.9E+01	4.0E-01		4.0E-01				6.4E-02	1.5E+01
~~Chloroprene~~	~~126-99-8~~		~~1.0E+00~~							~~3.9E+01~~
Chloro-o-toluidine, p-	95-69-2					2.7E-01		2.7E-01		1.4E+00 ~~2.4E+00~~
Chromium, (hexavalent, 6+) [4]	18540-29-9		2.0E-01	2.0E-02	2.0E-01	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~
barium chromate [4]	10294-40-3		2.0E-01	2.0E-02	2.0E-01	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~
calcium chromate [4]	13765-19-0		2.0E-01	2.0E-02	2.0E-01	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m^3)	Chronic Inhalation REL (µg/m^3)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
lead chromate [4]	7758-97-6		2.0E-01	2.0E-02	2.0E-01	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~
sodium dichromate [4]	10588-01-9		2.0E-01	2.0E-02	2.0E-01	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~
strontium chromate [4]	7789-06-2		2.0E-01	2.0E-02	2.0E-01	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~
Chromium trioxide (as chromic acid mist) [4]	1333-82-0		2.0E-03	2.0E-02	2.0E-03	5.1E+02		5.1E+02		7.7E-04 ~~1.3E-03~~
Copper and compounds	7440-50-8	1.0E+02	~~2.4E+00~~						2.2E-01	~~9.3E+01~~
Cresidine, p-	120-71-8					1.5E-01		1.5E-01		2.5E+00 ~~4.3E+00~~
Cresols (m-, o-, p-)	1319-77-3		6.0E+02		6.0E+02					2.3E+04
Cupferron	135-20-6					2.2E-01		2.2E-01		1.7E+00 2.9E+00
Cyanide and compounds (inorganic)	57-12-5	3.4E+02	9.0E+00		9.0E+00				7.5E-01	3.5E+02
hydrogen cyanide (hydrocyanic acid)	74-90-8	3.4E+02	9.0E+00		9.0E+00				7.5E-01	3.5E+02
Diaminoanisole, 2,4-	615-05-4					2.3E-02		2.3E-02		1.6E+01 ~~2.8E+01~~
Diaminotoluene, 2,4-	95-80-7					4.0E+00		4.0E+00		9.5E-02 ~~1.6E-01~~
Dibromo-3-chloropropane, 1,2- (DBCP)	96-12-8		~~2.0E-01~~			7.0E+00		7.0E+00		5.4E-02 ~~9.1E-02~~
Dichlorobenzene, 1,4-	106-46-7		8.0E+02		8.0E+02	4.0E-02		4.0E-02		9.5E+00 ~~1.6E+01~~
Dichlorobenzidine, 3,3-	91-94-1					1.2E+00		1.2E+00		3.2E-01 ~~5.3E-01~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m^3)	Chronic Inhalation REL (µg/m^3)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Dichloroethane, 1,1- (Ethylidene dichloride)	75-34-3					5.7E-03		5.7E-03		6.6E+01 ~~1.1E+02~~
Dichloroethylene, 1,1- [see vinylidene chloride]										
Diesel exhaust particulate matter [6]			5.0E+00		5.0E+00	1.1E+00		1.1E+00		3.4E-01 ~~5.8E-01~~
Diethanolamine	111-42-2		3.0E+00		3.0E+00					1.2E+02
Di(2-ethylhexyl)phthalate (DEHP) [4]	117-81-7		~~7.0E+01~~			8.4E-03	8.4E-03	9.3E-03		4.1E+01 ~~6.9E+01~~
Dimethylaminoazobenzene, p-	60-11-7					4.6E+00		4.6E+00		8.2E-02 ~~1.4E-01~~
Dimethyl formamide, N,N-	68-12-2		8.0E+01		8.0E+01					3.1E+03
Dinitrotoluene, 2,4-	121-14-2					3.1E-01		3.1E-01		1.2E+00 ~~2.1E+00~~
Dioxane, 1,4- (1,4-diethylene dioxide)	123-91-1	3.0E+03	3.0E+03		3.0E+03	2.7E-02		2.7E-02	6.6E+00	1.4E+01 ~~2.4E+01~~
Epichlorohydrin (1-chloro-2,3-epoxypropane)	106-89-8	1.3E+03	3.0E+00		3.0E+00	8.0E-02		8.0E-02	2.9E+00	4.7E+00 ~~8.0E+00~~
Epoxybutane, 1,2-	106-88-7		2.0E+01		2.0E+01					7.7E+02
~~Ethyl acrylate~~	~~140-88-5~~		~~4.8E+01~~							~~1.9E+03~~
Ethyl benzene	100-41-4		2.0E+03		2.0E+03	8.7E-03		8.7E-03		4.3E+01 ~~7.7E+04~~
Ethyl chloride (chloroethane)	75-00-3		3.0E+04		3.0E+04					1.2E+06
Ethylene dibromide (1,2-dibromoethane)	106-93-4		8.0E-01		8.0E-01	2.5E-01		2.5E-01		1.5E+00 ~~2.6E+00~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m^3)	Chronic Inhalation REL (µg/m^3)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Ethylene dichloride (1,2-dichloroethane)	107-06-2		4.0E+02		4.0E+02	7.2E-02		7.2E-02		5.3E+00 ~~8.9E+00~~
Ethylene glycol	107-21-1		4.0E+02		4.0E+02					1.5E+04
Ethylene glycol butyl ether – EGBE [see Glycol ethers]										
Ethylene oxide (1,2-epoxyethane)	75-21-8		3.0E+01		3.0E+01	3.1E-01		3.1E-01		1.2E+00 ~~2.1E+00~~
Ethylene thiourea	96-45-7					4.5E-02		4.5E-02		8.4E+00 ~~1.4E+01~~
Fluorides ~~and compounds~~		2.4E+02	1.3E+01	4.0E-02	1.3E+01				5.3E-01	5.0E+02
hydrogen fluoride (hydrofluoric acid)	7664-39-3	2.4E+02	1.4E+01	4.0E-02	1.4E+01				5.3E-01	5.4E+02
~~Fluorocarbons (chlorinated)~~			~~7.0E+02~~							~~2.7E+04~~
~~chlorinated fluorocarbon (CFC-113)~~	~~76-13-1~~		~~7.0E+02~~							~~2.7E+04~~
~~chlorodifluoromethane (Freon 22)~~	~~75-45-6~~		~~5.0E+04~~							~~1.9E+06~~
~~dichlorofluoromethane (Freon 21)~~	~~75-43-4~~		~~7.0E+02~~							~~2.7E+04~~
~~trichlorofluoromethane (Freon 11)~~	~~75-69-4~~		~~7.0E+02~~							~~2.7E+04~~
~~fluorocarbons (brominated)~~			~~7.0E+02~~							~~2.7E+04~~
Formaldehyde	50-00-0	5.5E+01 ~~9.4E+01~~	9.0E+00 ~~3.0E+00~~		9.0E+00	2.1E-02		2.1E-02	1.2E-01 ~~2.1E-01~~	1.8E+01 ~~3.0E+01~~
~~Freons [see Fluorocarbons]~~										
Glutaraldehyde	111-30-8		8.0E-02		8.0E-02					3.1E+00
Glycol ethers										
ethylene glycol butyl ether – EGBE (2-butoxy ethanol; butyl cellosolve)	111-76-2	1.4E+04	~~2.0E+01~~						3.1E+01	~~7.7E+02~~
ethylene glycol ethyl ether – EGEE (2-ethoxy ethanol; cellosolve) [3]	110-80-5	3.7E+02	7.0E+01		7.0E+01				8.2E-01	2.7E+03

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m³)	Chronic Inhalation REL (µg/m³)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
ethylene glycol ethyl ether acetate – EGEEA (2-ethoxyethyl acetate; cellosolve acetate) [3]	111-15-9	1.4E+02	3.0E+02		3.0E+02				3.1E-01	1.2E+04
ethylene glycol methyl ether – EGME (2-methoxy ethanol; methyl cellosolve) [3]	109-86-4	9.3E+01	6.0E+01		6.0E+01				2.1E-01	2.3E+03
ethylene glycol methyl ether acetate – EGMEA (2-methoxyethyl acetate; methyl cellosolve acetate)	110-49-6		9.0E+01		9.0E+01					3.5E+03
Hexachlorobenzene	118-74-1		~~2.8E+00~~			1.8E+00		1.8E+00		2.1E-01 ~~3.6E-01~~
Hexachlorocyclohexanes (mixed or technical grade) [4]	608-73-1		~~1.0E+00~~	~~3.0E-04~~		4.0E+00	4.0E+00	5.7E+00		6.9E-02 ~~1.2E-01~~
Hexachlorocyclohexane, alpha- [4]	319-84-6		~~1.0E+00~~	~~3.0E-04~~		4.0E+00	4.0E+00	5.7E+00		6.9E-02 ~~1.2E-01~~
Hexachlorocyclohexane, beta- [4]	319-85-7		~~1.0E+00~~	~~3.0E-04~~		4.0E+00	4.0E+00	5.7E+00		6.9E-02 ~~1.2E-01~~
Hexachlorocyclohexane, gamma- (lindane) [4]	58-89-9		~~1.0E+00~~	~~3.0E-04~~		1.1E+00	1.1E+00	1.6E+00		2.5E-01 ~~4.2E-01~~
~~Hexachlorocyclopentadiene~~	~~77-47-4~~		~~2.4E-01~~							~~9.3E+00~~
Hexane, n-	110-54-3		7.0E+03		7.0E+03					2.7E+05
Hydrazine	302-01-2		2.0E-01		2.0E-01	1.7E+01		1.7E+01		2.2E-02 ~~3.8E-02~~
Hydrochloric acid (hydrogen chloride)	7647-01-0	2.1E+03	9.0E+00		9.0E+00				4.6E+00	3.5E+02
~~Hydrogen bromide [see bromine & compounds]~~										
Hydrogen cyanide (hydrocyanic acid) [see cyanide & compounds]										
Hydrogen fluoride (hydrofluoric acid) [see fluorides & compounds]										
Hydrogen selenide [see selenium compounds]										

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m³)	Chronic Inhalation REL (µg/m³)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Hydrogen sulfide	7783-06-4	4.2E+01	1.0E+01		1.0E+01				9.3E-02	3.9E+02
Isophorone	78-59-1		2.0E+03		2.0E+03					7.7E+04
Isopropyl alcohol (isopropanol)	67-63-0	3.2E+03	7.0E+03		7.0E+03				7.1E+00	2.7E+05
Lead and compounds (inorganic) [4]	7439-92-1					4.2E-02	8.5E-03	1.2E-01		3.2E+00 ~~5.4E+00~~
lead acetate [4]	301-04-2					4.2E-02	8.5E-03	1.2E-01		3.2E+00 ~~5.4E+00~~
lead phosphate [4]	7446-27-7					4.2E-02	8.5E-03	1.2E-01		3.2E+00 ~~5.4E+00~~
lead subacetate [4]	1335-32-6					4.2E-02	8.5E-03	1.2E-01		3.2E+00 ~~5.4E+00~~
Lindane [see hexachlorocyclohexane, gamma]										
Maleic anhydride	108-31-6		7.0E-01		7.0E-01					2.7E+01
Manganese and compounds	7439-96-5		9.0E-02 ~~2.0E-01~~		9.0E-02					3.5E+00 ~~7.7E+00~~
Mercury and compounds (inorganic) [4]	7439-97-6	6.0E-01 ~~1.8E+00~~	3.0E-02 ~~9.0E-02~~	1.6E-04 ~~3.0E-04~~	7.1E-03				1.3E-03 ~~4.0E-03~~	2.7E-01 ~~5.6E-01~~
mercuric chloride [4]	7487-94-7	6.0E-01 ~~1.8E+00~~	3.0E-02 ~~9.0E-02~~	1.6E-04 ~~3.0E-04~~	7.1E-03				1.3E-03 ~~4.0E-03~~	2.7E-01 ~~5.6E-01~~
~~Mercury and compounds (organic)~~										
~~methyl mercury~~	~~593-74-8~~		~~1.0E+00~~							~~3.9E+01~~
Methanol (methyl alcohol)	67-56-1	2.8E+04	4.0E+03		4.0E+03				6.2E+01	1.5E+05
Methyl bromide (bromomethane)	74-83-9	3.9E+03	5.0E+00		5.0E+00				8.6E+00	1.9E+02

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m³)	Chronic Inhalation REL (µg/m³)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Methyl chloroform (1,1,1-trichloroethane)	71-55-6	6.8E+04	1.0E+03		1.0E+03				1.5E+02	3.9E+04
Methyl ethyl ketone (MEK) (2-butanone)	78-93-3	1.3E+04	~~1.0E+03~~						2.9E+01	~~3.9E+04~~
Methyl isocyanate	624-83-9		1.0E+00		1.0E+00					3.9E+01
~~Methyl mercury [see mercury & compounds]~~										
~~Methyl methacrylate~~	~~80-62-6~~		~~9.8E+02~~							~~3.8E+04~~
Methyl tertiary-butyl ether (MTBE)	1634-04-4		8.0E+03		8.0E+03	1.8E-03		1.8E-03		2.1E+02 ~~3.6E+02~~
Methylene bis (2-chloroaniline), 4,4'- (MOCA)	101-14-4					1.5E+00		1.5E+00		2.5E-01 ~~4.3E-01~~
Methylene chloride (dichloromethane)	75-09-2	1.4E+04	4.0E+02		4.0E+02	3.5E-03		3.5E-03	3.1E+01	1.1E+02 ~~1.8E+02~~
Methylene dianiline, 4,4'- (and its dichloride) [4]	101-77-9		2.0E+01		2.0E+01	1.6E+00	1.6E+00	1.6E+00		2.4E-01 ~~4.1E-01~~
Methylene diphenyl isocyanate	101-68-8		7.0E-01		7.0E-01					2.7E+01
Michler's ketone (4,4'-bis(dimethylamino)benzophenone)	90-94-8					8.6E-01		8.6E-01		4.4E-01 ~~7.4E-01~~
~~Mineral fibers (<1% FREE SILICA)~~			~~2.4E+01~~							~~9.3E+02~~
~~ceramic fibers (man-made)~~			~~2.4E+01~~							~~9.3E+02~~
~~glasswool (man-made fibers)~~			~~2.4E+01~~							~~9.3E+02~~
~~mineral fibers (fine: man-made)~~			~~2.4E+01~~							~~9.3E+02~~
~~rockwool (man-made fibers)~~			~~2.4E+01~~							~~9.3E+02~~
~~slagwool (man-made fibers)~~			~~2.4E+01~~							~~9.3E+02~~
Naphthalene [see polycylcic aromatic hydrocarbons]										
Nickel and compounds [4] *(values also apply to:)*	7440-02-0	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL ($\mu g/m^3$)	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Oral Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
nickel acetate [4]	373-02-4	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
nickel carbonate [4]	3333-39-3	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
nickel carbonyl [4]	13463-39-3	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
nickel hydroxide [4]	12054-48-7	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
Nickelocene [4]	1271-28-9	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
nickel oxide [4]	1313-99-1	6.0E+00	1.0E-01	5.0E-02	1.0E-01	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
nickel refinery dust from the pyrometallurgical process [4]		6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
nickel subsulfide [4]	12035-72-2	6.0E+00	5.0E-02	5.0E-02	5.0E-02	9.1E-01		9.1E-01	1.3E-02	4.3E-01 ~~7.3E-01~~
Nitric acid	7697-37-2	8.6E+01							1.9E-01	
~~Nitrobenzene~~	~~98-95-3~~		~~1.7E+00~~							~~6.6E+01~~
~~Nitropropane, 2-~~	~~79-46-9~~		~~2.0E+01~~							~~7.7E+02~~
Nitrosodi-n-butylamine, N-	924-16-3					1.1E+01		1.1E+01		3.4E-02 ~~5.8E-02~~
Nitrosodi-n-propylamine, N-	621-64-7					7.0E+00		7.0E+00		5.4E-02 ~~9.1E-02~~
Nitrosodiethylamine, N-	55-18-5					3.6E+01		3.6E+01		1.1E-02 ~~1.8E-02~~
Nitrosodimethylamine, N-	62-75-9					1.6E+01		1.6E+01		2.4E-02 ~~4.0E-02~~
Nitrosodiphenylamine, N-	86-30-6					9.0E-03		9.0E-03		4.2E+01 ~~7.1E+01~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m³)	Chronic Inhalation REL (µg/m³)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Nitroso-n-methylethylamine, N-	10595-95-6					2.2E+01		2.2E+01		1.7E-02 ~~2.9E-02~~
Nitrosomorpholine, N-	59-89-2					6.7E+00		6.7E+00		5.6E-02 ~~9.6E-02~~
Nitrosopiperidine, N-	100-75-4					9.4E+00		9.4E+00		4.0E-02 ~~6.8E-02~~
Nitrosopyrrolidine, N-	930-55-2					2.1E+00		2.1E+00		1.8E-01 ~~3.0E-01~~
Nitrosodiphenylamine, p-	156-10-5					2.2E-02		2.2E-02		1.7E+01 ~~2.9E+01~~
Ozone	10028-15-6	1.8E+02	~~1.8E+02~~						4.0E-01	~~7.0E+03~~
Pentachlorophenol	87-86-5		~~2.0E-01~~			1.8E-02		1.8E-02		2.1E+01 ~~7.7E+00~~
Perchloroethylene (tetrachloroethylene)	127-18-4	2.0E+04	3.5E+01		3.5E+01	2.1E-02		2.1E-02	4.4E+01	1.8E+01 ~~3.0E+01~~
Phenol	108-95-2	5.8E+03	2.0E+02		2.0E+02				1.3E+01	7.7E+03
Phosgene	75-44-5	4.0E+00							8.8E-03	
Phosphine	7803-51-2		8.0E-01		8.0E-01					3.1E+01
Phosphoric acid	7664-38-2		7.0E+00		7.0E+00					2.7E+02
~~Phosphorus (white)~~	~~7723-14-0~~		~~7.0E-02~~							~~2.7E+00~~
Phthalic anhydride	85-44-9		2.0E+01		2.0E+01					7.7E+02
PCBs (polychlorinated biphenyls) [low risk] [4, 7]	1336-36-3		~~1.2E+00~~	2.0E-05		7.0E-02	7.0E-02			4.7E-01 ~~8.0E-01~~
PCBs (polychlorinated biphenyls) [high risk] [4, 7]	1336-36-3		~~1.2E+00~~	2.0E-05		2.0E+00	2.0E+00	2.7E+01		1.7E-02 ~~2.8E-02~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL ($\mu g/m^3$)	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Oral Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and dioxin-like polychlorinated biphenyls (PCBs) (as 2,3,7,8-PCDD equivalent) [4, 8]	See Footnote 8		4.0E-05	1.0E-08	3.8E-06	1.3E+05	1.3E+05	1.3E+06		3.4E-07 ~~5.7E-07~~
Polycyclic aromatic hydrocarbon (PAH) (as B(a)P-equivalent) [4, 9]	See Footnote 9					3.9E+00	1.2E+01	6.4E+01		6.9E-03 ~~1.1E-02~~
Naphthalene	91-20-3		9.0E+00		9.0E+00	1.2E-01		1.2E-01		3.2E+00 ~~5.3E+00~~
Potassium bromate ~~[see bromine & compounds]~~	7758-01-2		1.7E+00		1.7E+00	4.9E-01		4.9E-01		7.7E-1 ~~1.3+00~~
Propane sultone, 1,3-	1120-71-4					2.4E+00		2.4E+00		1.6E-01 ~~2.7E-01~~
Propylene (propene)	115-07-1		3.0E+03		3.0E+03					1.2E+05
Propylene glycol monomethyl ether	107-98-2		7.0E+03		7.0E+03					2.7E+05
Propylene oxide	75-56-9	3.1E+03	3.0E+01		3.0E+01	1.3E-02		1.3E-02	6.8E+00	2.9E+01 ~~4.9E+01~~
Selenium and compounds	7782-49-2		2.0E+01		2.0E+01					7.7E+02
hydrogen selenide	7783-07-5	5.0E+00							1.1E-02	
selenium sulfide	7446-34-6		2.0E+01		2.0E+01					7.7E+02
Silica (crystalline, respirable)	7631-86-9		3.0E+00		3.0E+00					1.2E+02
Sodium hydroxide	1310-73-2	8.0E+00	~~4.8E+00~~						1.8E-02	~~1.9E+02~~
Styrene	100-42-5	2.1E+04	9.0E+02		9.0E+02				4.6E+01	3.5E+04
Sulfates		1.2E+02	~~2.5E+01~~						2.6E-01	~~9.7E+02~~
Sulfuric acid and oleum	7664-93-9	1.2E+02	1.0E+00		1.0E+00				2.6E-01	3.9E+01

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL ($\mu g/m^3$)	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Oral Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
sulfuric acid	7664-93-9	1.2E+02	1.0E+00		1.0E+00				2.6E-01	3.9E+01
sulfur trioxide	7446-71-9	1.2E+02	1.0E+00		1.0E+00				2.6E-01	3.9E+01
oleum	8014-95-7	1.2E+02	1.0E+00		1.0E+00				2.6E-01	3.9E+01
Tetrachloroethane, 1,1,2,2-	79-34-5					2.0E-01		2.0E-01		1.9E+00 ~~3.2E+00~~
~~Tetrachlorophenols~~	~~25167-83-3~~		~~8.8E+01~~							~~3.4E+03~~
Thioacetamide	62-55-5					6.1E+00		6.1E+00		6.2E-02 ~~1.0E-01~~
Toluene	108-88-3	3.7E+04	3.0E+02		3.0E+02				8.2E+01	1.2E+04
Toluene diisocyantates	26471-62-5		7.0E-02		7.0E-02	3.9E-02		3.9E-02		2.7E+00
toluene-2,4-diisocyanate	584-84-9		7.0E-02		7.0E-02	3.9E-02		3.9E-02		2.7E+00
toluene-2,6-diisocyanate	91-08-7		7.0E-02		7.0E-02	3.9E-02		3.9E-02		2.7E+00
Trichloroethane, 1,1,1 (see methyl chloroform)										
Trichloroethane, 1,1,2- (vinyl trichloride)	79-00-5					5.7E-02		5.7E-02		6.6E+00 ~~1.1E+01~~
Trichloroethylene	79-01-6		6.0E+02		6.0E+02	7.0E-03		7.0E-03		5.4E+01 ~~9.1E+01~~
Trichlorophenol, 2,4,6-	88-06-2					7.0E-02		7.0E-02		5.4E+00 ~~9.1E+00~~
Triethylamine	121-44-8	2.8E+03	2.0E+02		2.0E+02				6.2E+00	7.7E+03
Urethane (ethyl carbamate)	51-79-6					1.0E+00		1.0E+00		3.8E-01 ~~6.4E-01~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

Chemical	CAS Number [1]	Acute Inhalation REL (µg/m^3)	Chronic Inhalation REL (µg/m^3)	Chronic Oral REL (mg/kg-day)	CREL Weighting Factor[10]	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Oral Cancer Potency Factor (mg/kg-day)$^{-1}$	CP Weighting Factor[10]	Acute (1-hr. max.) Trigger Level [2] (lb/hour)	Chronic Trigger Level [2] (lb/year)
Vanadium Compounds										
vanadium (fume or dust)	7440-62-2	3.0E+01							6.6E-02	
vanadium pentoxide	1314-62-1	3.0E+01							6.6E-02	
Vinyl acetate	108-05-4		2.0E+02		2.0E+02					7.7E+03
~~Vinyl bromide~~	~~593-60-2~~		~~7.0E+00~~							~~2.7E+02~~
Vinyl chloride (chloroethylene)	75-01-4	1.8E+05	~~2.6E+01~~			2.7E-01		2.7E-01	4.0E+02	1.4E+00 ~~2.4E+00~~
Vinylidene chloride (1,1-dichloroethylene)	75-35-4		7.0E+01		7.0E+01					2.7E+03
Xylenes (mixed isomers)	1330-20-7	2.2E+04	7.0E+02		7.0E+02				4.9E+01	2.7E+04
m-xylene	108-38-3	2.2E+04	7.0E+02		7.0E+02				4.9E+01	2.7E+04
o-xylene	95-47-6	2.2E+04	7.0E+02		7.0E+02				4.9E+01	2.7E+04
p-xylene	106-42-3	2.2E+04	7.0E+02		7.0E+02				4.9E+01	2.7E+04
~~Zinc and compounds~~	~~7440-66-6~~		~~3.5E+01~~							~~1.4E+03~~
~~*zinc oxide*~~	~~1314-13-2~~		~~3.5E+01~~							~~1.4E+03~~

Table 2-5-1 Toxic Air Contaminant Trigger Levels

---

[1] **Chemical Abstract Number (CAS):**
CAS numbers are not available for many chemical groupings and mixtures.

[2] **Trigger Levels:**
All trigger levels are presented in scientific notation (i.e., exponential form based on powers of the based number 10.) For example: 4.9E+01 is equivalent to $4.9X10^{1}$, or 49; 6.6E-02 is equivalent to $6.6X10^{-2}$, or 0.066; and 5.8E+00 is equivalent to $5.8X10^{0}$, or 5.8.

[3] **Averaging Period for Non-Cancer Acute Trigger Levels:**
The averaging period for non-cancer acute trigger levels is generally a one-hour exposure. However, some are based on several hours of exposure. The screening levels for the following substances should be compared to estimated emissions occurring over a time period other than maximum one-hour emissions (e.g., a 4-hour trigger level should be compared to the maximum 4-hour average concentration estimated from the maximum emissions occurring in a 4-hour period). However, for conservative screening purposes, a maximum one-hour emission level can be compare to all acute trigger levels.
4-hour: arsenic and inorganic arsenic compounds
6-hour: benzene, carbon disulfide, ethylene glycol ethyl ether, ethylene glycol ethyl ether acetate, ethylene glycol methyl ether
7-hour: carbon tetrachloride, chloroform

[4] **Chemicals for Which Multi-Pathway Risks are Assessed:**
Trigger levels are adjusted to include the impact from default non-inhalation pathways.

[5] **Asbestos:**
The units for the inhalation cancer potency factor for asbestos are $(100 \text{ PCM fibers/m}^3)^{-1}$. A conversion factor of 100 fibers/0.003 μg can be multiplied by a receptor concentration of asbestos expressed in $\mu g/m^3$. Unless other information necessary to estimate the concentration (fibers/m^3) of asbestos at receptors of interest is available, an inhalation cancer potency factor of $220 \text{ (mg/kg-day)}^{-1}$ is available.

[6] **Diesel Exhaust Particulate Matter:**
Diesel exhaust particulate matter should be used as a surrogate for all TAC emissions from diesel-fueled compression-ignition internal combustion engines. However, diesel exhaust particulate matter should not be used for other types of diesel-fueled combustion equipment, such as boilers or turbines. For equipment other than diesel-fueled compression-ignition internal combustion engines, emissions should be determined for individual TACs and compared to the appropriate trigger level for each TAC.

[7] **Polychlorinated Biphenyls:**
Low Risk: Use in cases where congeners with more than four chlorines comprise less than one-half percent of total polychlorinated biphenyls.
High Risk: Use in cases where congeners with more than four chlorines do not comprise less than one-half percent of total polychlorinated biphenyls.

[8] **Polychlorinated Dibenzo-p-Dioxins (PCDDs), Polychlorinated Dibenzofurans (PCDFs), and Dioxin-like Polychlorinated Biphenyls (PCBs):** These substances are PCDDs, PCDFs, and dioxin-like PCBs for which OEHHA has adopted the World Health Organization (WHO_{97}) Toxicity Equivalency Factor (TEF) scheme for evaluating cancer risk due to exposure to samples containing mixtures of PCDDs, PCDFs, and dioxin-like PCBs. PCDDs, PCDFs, and dioxin-like PCBs should be evaluated as PCDD-equivalent. This evaluation process consists of multiplying individual PCDD-, PCDF-, and dioxin-like PCB-specific emission levels with their corresponding TEFs listed below. The sum of these products is the PCDD-equivalent and should be compared to the PCDD-equivalent trigger level.

PCDD	CAS Number	TEF
2,3,7,8-tetrachlorodibenzo-p-dioxin	1746-01-6	1.0
1,2,3,7,8-pentachlorodibenzo-p-dioxin	40321-76-4	1.0
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	39227-28-6	0.1
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	57653-85-7	0.1
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	19408-74-3	0.1
1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	35822-46-9	0.01
1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin	3268-87-9	0.0001

PCDF	CAS Number	TEF
2,3,7,8-tetrachlorodibenzofuran	5120-73-19	0.1
1,2,3,7,8-pentachlorodibenzofuran	57117-41-6	0.05
2,3,4,7,8-pentachlorodibenzofuran	57117-31-4	0.5
1,2,3,4,7,8-hexachlorodibenzofuran	70648-26-9	0.1
1,2,3,6,7,8-hexachlorodibenzofuran	57117-44-9	0.1
1,2,3,7,8,9-hexachlorodibenzofuran	72918-21-9	0.1
2,3,4,6,7,8-hexachlorodibenzofuran	60851-34-5	0.1
1,2,3,4,6,7,8-heptachlorodibenzofuran	67562-39-4	0.01
1,2,3,4,7,8,9-heptachlorodibenzofuran	55673-89-7	0.01
1,2,3,4,6,7,8,9-octachlorodibenzofuran	39001-02-0	0.0001

Dioxin-like PCBs (coplanar PCBs)	CAS Number	TEF
PCB 77 (3,3'4,4'-tetrachlorobiphenyl)	32598-13-3	0.0001
PCB 81 (3,4,4',5-tetrachlorobiphenyl)	70362-50-4	0.0001
PCB 105 (2,3,3'4,4'-pentachlorobiphenyl)	32598-14-4	0.0001
PCB 114 (2,3,4,4'5-pentachlorobiphenyl)	74472-37-0	0.0005
PCB 118 (2,3',4,4',5-pentachlorobiphenyl)	31508-00-6	0.0001
PCB 123 (2',3,4,4',5-pentachlorobiphenyl)	65510-44-3	0.0001
PCB 126 (3,3',4,4',5-pentachlorobiphenyl)	57465-28-8	0.1
PCB 156 (2,3,3',4,4',5-hexachlorobiphenyl)	38380-08-4	0.0005
PCB 157 (2,3,3',4,4',5'-hexachlorobiphenyl)	69782-90-7	0.0005
PCB 167 (2,3',4,4',5,5'-hexachlorobiphenyl)	52663-72-6	0.00001
PCB 169 (3,3',4,4',5,5'-hexachlorobiphenyl)	32774-16-6	0.01
PCB 170 (2,2',3,3',4,4',5-heptachlorobiphenyl)	35065-30-6	0
PCB 180 (2,2',3,4,4',5,5'-heptachlorobiphenyl)	35065-29-3	0

PCB 189 (2,3,3',4,4',5,5'-heptachlorobiphenyl)	39635-31-9	0.0001

[9] **Polycyclic Aromatic Hydrocarbons (PAHs):**
These substances are PAH-derivatives that have OEHHA-developed Potency Equivalency Factors (PEFs). PAHs should be evaluated as benzo(a)pyrene-equivalents. This evaluation process consists of multiplying individual PAH-specific emission levels with their corresponding PEFs listed below. The sum of these products is the benzo(a)pyrene-equivalent level and should be compared to the benzo(a)pyrene equivalent trigger level.

PAH or derivative	CAS Number	PEF
benz(a)anthracene	56-55-3	0.1
benzo(b)fluoranthene	205-99-2	0.1
benzo(j)fluoranthene	205-82-3	0.1
benzo(k)fluoranthene	207-08-9	0.1
benzo(a)pyrene	50-32-8	1.0
chrysene	218-01-9	0.01
dibenz(a,j)acridine	224-42-0	0.1
dibenz(a,h)acridine	226-36-8	0.1
dibenz(a,h)anthracene	53-70-3	1.05
7H-dibenzo(c,g)carbazole	194-59-2	1.0
dibenzo(a,e)pyrene	192-65-4	1.0
dibenzo(a,h)pyrene	189-64-0	10
dibenzo(a,i)pyrene	189-55-9	10
dibenzo(a,l)pyrene	191-30-0	10
7,12-dimethylbenz(a)anthracene	57-97-6	64
indeno(1,2,3-cd)pyrene	193-39-5	0.1
5-methylchrysene	3697-24-3	1.0
3-methylcholanthrene	56-49-5	5.7
5-nitroacenaphthene	602-87-9	0.03
1-nitropyrene	5522-43-0	0.1
4-nitropyrene	57835-92-4	0.1
1,6-dinitropyrene	42397-64-8	10
1,8-dinitropyrene	42397-65-9	1.0
6-nitrocrysene	7496-02-8	10
2-nitrofluorene	607-57-8	0.01

[10] **CREL (chronic Reference Exposure Level) and CP (Cancer Potency) Weighting Factors: These factors are to be used for purposes of calculating toxicity weighted emissions. Factors were developed assuming multi-pathway exposure where applicable, and continuously operating sources for residential receptor exposure.**

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix B:

Proposed Revisions to the BAAQMD's

Health Risk Screening Analysis (HRSA) Guidelines

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

BAAQMD

Air Toxics NSR Program

Health Risk Screening Analysis

(HRSA) Guidelines

~~June 2005~~

December 2009

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CA 94109

BAAQMD Air Toxics NSR Program
Health Risk Screening Analysis (HRSA) Guidelines

1. INTRODUCTION

This document describes the Bay Area Air Quality Management District's guidelines for conducting health risk screening analyses. Any health risk screening analysis (HRSA) that is required pursuant to Regulation 2 Permits, Rule 1 General Requirements or Rule 5 New Source Review of Toxic Air Contaminants shall be conducted in accordance with these guidelines.

In accordance with Regulation 2-5-402, these guidelines generally conform to the Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. In addition, these guidelines are in accordance with State risk assessment and risk management policies and guidelines in effect as of ~~January 1, 2005~~ June 1, 2009. Through the District's rule development process, these guidelines will periodically be updated to clarify procedures, amend health effects data, or incorporate other revisions to regulatory guidelines.

2. PROCEDURES

The procedures described below constitute the Regulation 2-5-603 Health Risk Screening Analysis Procedures. Any HRSA shall be completed by following the procedures described in the OEHHA Health Risk Assessment Guidelines for the Air Toxics Hot Spots Program that were adopted by OEHHA on October 3, 2003 and any State risk assessment and risk management policies and guidelines in effect as of ~~January 1, 2005~~ June 1, 2009.

The OEHHA Health Risk Assessment Guidelines contain several sections which identify (a) the overall methodology, (b) the exposure assessment assumptions and procedures, and (c) the health effects data (cancer potency factors, chronic reference exposure levels, and acute reference exposure levels).

A summary of OEHHA's Health Risk Assessment Guidelines and an index of the relevant documents are located at:

http://www.oehha.ca.gov/air/hot_spots/index.html

OEHHA's risk assessment methodology is located at:

http://www.oehha.ca.gov/air/risk_assess/index.html

The exposure assessment and stochastic technical support document (Part IV of OEHHA's Risk Assessment Guidelines) is located at:

http://www.oehha.ca.gov/air/exposure_assess/index.html

The Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustments to Allow for Early Life Stage Exposures (May 2009) is located at:

http://www.oehha.ca.gov/air/hot_spots/tsd052909.html

~~The cancer potency factors for carcinogenic compounds (Part II of OEHHA's Risk Assessment Guidelines) are located at:~~

~~**http://www.oehha.ca.gov/air/cancer_guide/hsca2.html**~~

The Technical Support Document for the Derivation of Noncancer Reference Exposure Levels is located at:

http://www.oehha.ca.gov/air/hot_spots/rels_dec2008.html

~~The chronic reference exposure levels (RELs), which are Part III of OEHHA's Risk Assessment Guideline, are located at:~~

~~**http://www.oehha.ca.gov/air/chronic_rels/index.html**~~

~~The acute reference exposure levels (RELs), which are Part I of OEHHA's Risk Assessment Guideline, are located at:~~

~~**http://www.oehha.ca.gov/air/acute_rels/index.html**~~

Sections 2.1 through 2.3 below clarify and highlight some of the exposure assessment procedures including exposure assumptions (e.g., breathing rate and exposure duration) and health effect values to be used for conducting HRSAs.

2.1 Clarifications of Exposure Assessment Procedures

This section clarifies and highlights some of the exposure assessment procedures that should be followed when conducting an HRSA. Please note that OEHHA is currently revising the Technical Support Document (TSD) for Exposure Assessment. When the revised TSD for Exposure Assessment is finalized and adopted, the District will revise the HRSA Guidelines accordingly.

2.1.1 Breathing Rate

On October 9, 2003, a statewide interim Risk Management Policy for inhalation-based residential cancer risk was adopted by the California Air Resources Board (ARB) and Cal/EPA's OEHHA (http://www.arb.ca.gov/toxics/rmpolicy.pdf). For the HRSA methodology used in the Air Toxics NSR Program, the District has conformed with these State guidelines and adopted the interim exposure assessment recommendations made by ARB and OEHHA. The interim policy recommends where a single cancer risk value for a residential receptor is needed or prudent for risk management decision-making, the potential cancer risk estimate for the inhalation exposure pathway be based on the breathing rate representing the 80th percentile value of the breathing rate range of values (302 L/kg-day).

To assess potential inhalation exposure to offsite workers, OEHHA recommends assuming a breathing rate of 149 L/kg-day. This value corresponds to a 70 kg worker breathing 1.3 m^3/hour (breathing rate recommended by USEPA as an hourly average for outdoor workers) for an eight-hour day.

For children, OEHHA recommends assuming a breathing rate of 581 L/kg-day to assess potential risk via the inhalation exposure pathway. This value represents the upper 95% percentile of daily breathing rates for children.

2.1.2 Exposure Time and Frequency

Based on OEHHA recommendations, the District will estimate cancer risk to residential receptors assuming exposure occurs 24 hours per day for 350 days per year. For a worker receptor, exposure is assumed to occur 8 hours per day for 245 days per year. However, for some professions (e.g., teachers) a different schedule may be more appropriate. For children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year.

2.1.3 Exposure Duration

Based on OEHHA recommendations, the District will estimate cancer risk to residential receptors based on a 70-year lifetime exposure. Although 9-year and 30-year exposure scenarios may be presented for information purposes, risk management decisions will be made based on 70-year exposure duration for residential receptors. For worker receptors, risk management decisions will be made based on OEHHA's recommended exposure duration of 40 years. Cancer risk estimates for children at school sites will be calculated based on a 9 year exposure duration.

2.2 Health Effects Values

Chemical-specific health effects values have been consolidated and are presented in Table 2-5-1 for use in conducting HRSAs. Toxicity criteria summarized in Table 2-5-1 represent health effects values that were adopted by OEHHA/ARB as of ~~January 1, 2005~~ June 1, 2009. Although 8-hour RELs for six chemicals were adopted in December 2008, these 8-hour RELs will not be used in conducting HRSAs until OEHHA finalizes and adopts the revised TSD for Exposure Assessment. Prior to use in Regulation 2, Rule 5, any new or revised health effects values adopted by OEHHA/ARB after ~~January 1, 2005~~ June 1, 2009 will be reviewed by the District through a rule development process. The District will evaluate the new criteria for implementation, enforcement, and feasibility of compliance with the project risk limits.

2.3 Cancer Risk Calculations

In accordance with OEHHA's revised health risk assessment guidelines (specifically, OEHHA's Technical Support Document (TSD) for Cancer Potency Factors, adopted June 1, 2009), calculation of cancer risk estimates should incorporate age sensitivity factors (ASFs).

The revised TSD for Cancer Potency Factors provides updated calculation procedures used to consider the increased susceptibility of infants and children to carcinogens, as compared to adults. The updated calculation procedure includes the use of age-specific weighting factors in calculating cancer risks from exposures of infants, children and adolescents, to reflect their anticipated special sensitivity to carcinogens. OEHHA recommends weighting cancer risk by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures that occur from 2 years through 15 years of age. These weighting factors should be applied to all carcinogens. For estimating cancer risk for residential receptors, the incorporation of the ASFs results in a cancer risk adjustment factor of 1.7. For estimating cancer risk for student receptors, a cancer risk adjustment factor of 3 should be applied. For estimating cancer risk for worker receptors, a cancer risk adjustment factor of 1 should be applied.

The cancer risk adjustment factors were developed based on the following:

Receptor	**Age Bins**	**ASF**	**Duration**	**Cancer Risk Adjustment Factor**
Resident	Third trimester to age 2 years	10	2.25/70	0.32
	Age 2 to age 16 years	3	14/70	0.6
	Age 16 to 70 years	1	54/70	0.77
				1.7
Student	Age 2 to age 16 years	3	9 years	***3***
Worker	Age 16 to 70 years	1	40 years	***1***

Since the exposure duration for a student receptor (9 years), and worker receptor (40 years), falls within a single age bin, the student cancer risk adjustment factor is 3 and the worker cancer risk adjustment factor is 1.

Cancer risk adjustment factors should be used to calculate all cancer risk estimates. Please note that these ASFs represent default values. In cases where there are adequate data for a specific carcinogen potency by age, OEHHA will recommend chemical-specific adjustments to cancer risk estimates. In addition, OEHHA is currently revising the TSD for Exposure Assessment. When the revised TSD for Exposure Assessment is finalized and adopted, the District will revise the HRSA Guidelines accordingly.

Below is the equation for calculating cancer risk estimates:

Cancer Risk = Dose * Cancer Risk Adjustment Factor * Cancer Potency Factor

2.4 Stochastic Risk Assessment

For a stochastic, multipathway risk assessment, the potential cancer risk should be reported for the full distribution of exposure from all exposure pathways included in the risk assessment. For risk management decisions, the potential cancer risk from a stochastic, multipathway risk assessment should be based on the 95th percentile cancer risk.

3. Assessment of Acrolein Emissions

Currently, CARB does not have certified emission factors or an analytical test method for acrolein. Therefore, since the appropriate tools needed to implement and enforce acrolein emission limits are not available, the District will not conduct a HRSA for emissions of acrolein. ~~In addition, due to the significant uncertainty in the derivation, OEHHA is currently re-evaluating the acute REL for acrolein.~~ When the necessary tools are developed, the District will re-evaluate this specific evaluation procedure and the HRSA guidelines will be revised.

References

1 *"Air Toxics "Hot Spots" Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, ", OEHHA, August 2003*

2 *"Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part IV. Technical Support Document for Exposure Assessment and Stochastic Analysis", OEHHA, September 2000*

3 "Air Toxics "Hot Spots" Program Risk Assessment Guideline, Technical Support Document for Cancer Potency Factors: Methodologies for derivation, listing of available values, and adjustments to allow for early life stage exposures", OEHHA, May, 2009.

~~*3 "Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors", OEHHA, updated December, 2002.*~~

4 "Air Toxics "Hot Spots" Program Risk Assessment Guidelines Technical Support Document for the Determination of Noncancer Reference Exposure Levels", OEHHA, June 2008.

~~*4 "Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part III, Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels", OEHHA, April 2000.*~~

~~*5 "Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part I, Technical Support Document for the Determination of Acute Reference Exposure Levels for Airborne Toxicants", OEHHA, March 1999.*~~

5 "Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites: Final Report", Integrated Risk Assessment Section, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, February, 2004.

6 "Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values", California Air Resources Board, updated February, 2009.

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix C:

Guidelines for Designation of Priority Communities

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

Guidelines for Designation of **Priority Communities**

December 2009

BAY AREA AIR QUALITY MANAGEMENT
DISTRICT 939 ELLIS STREET SAN FRANCISCO, CA 94109

Guidelines for Designation of Priority Communities

1. INTRODUCTION

This document describes the Bay Area Air Quality Management District's guidelines for designation of "Priority Communities". Priority Communities are areas within the jurisdiction of the Bay Area Air Quality Management District that have higher toxic air contaminant (TAC) exposure compared to other areas within the District, sensitive subpopulations, and other compounding factors that may result in disproportionately higher adverse health effects for the people who live and work in these communities. Priority Communities are the main focus of the District's Community Air Risk Evaluation (CARE) Program, which implements and supports a variety of health risk mitigation measures in the Bay Area. The CARE Program strives to eliminate health risk disparities for Priority Communities and endeavors to reduce air pollution related health risks throughout the Bay Area. Through the District's Air Toxics New Source Review (NSR) Program, the District will also track TAC emission increases and TAC emission reductions that occur within Priority Communities. The District will periodically evaluate the cumulative health impacts of these TAC emission changes to determine if the Air Toxics NSR Program is effectively reducing health risk contributions from stationary sources located within Priority Communities, or if additional stationary source mitigation measures are necessary.

2. BACKGROUND

The Community Air Risk Evaluation (CARE) program was initiated in 2004 to identify Bay Area communities that have both high exposures to toxic air contaminants (TAC) and populations that may be particularly sensitive to the adverse health effects of TAC. The CARE program seeks then to implement mitigation measures focused on reducing TAC emissions that affect these impacted communities.

Starting in 2006, the District developed gridded TAC emissions inventories and compiled demographic information that were used to identify Priority Communities for the purposes of distributing grant and incentive funding. In 2009, the District completed regional modeling of TAC on a one kilometer by one kilometer grid system. This modeling was used to estimate cancer risk and TAC

population exposures for the entire District. The information derived from the modeling was then used to update and refine the identification of Priority Communities.

3. PROCEDURES

Specifically, one kilometer modeling yielded estimates of annual concentrations of five key compounds—diesel particulate matter, benzene, 1,3-butadiene, formaldehyde, and acetaldehyde—for year 2005. These concentrations were multiplied by their respective unit cancer risk factors, as established by the State's Office of Environmental Health Hazard Assessment (OEHHA) to estimate the expected excess cancer risk per million people from these compounds.

The datasets compiled to identify impacted communities were determined as follows:

- **Exposure of sensitive populations:** Sensitive populations from the 2000 U.S. Census database were identified as youth (under 18) and seniors (over 64) and mapped to the same one kilometer grid used for the toxics modeling. Excess cancers from TAC exposure were determined by multiplying these sensitive populations by the model-estimated excess risk to establish a data set representing sensitive populations with high TAC exposures.
- **TAC emissions:** TAC emissions (year 2005) were mapped to the one kilometer grid and also scaled by their unit cancer risk factor to provide a data set representing source regions for TAC emissions.
- **Poverty-level:** Block-group level household income data from the U.S. Census database were used to identify block groups with family incomes where more than 40% of the population was below 185% of the federal poverty level (FPL).

These datasets were used following the methodology defined below to create polygons of Priority Communities:

1. The three datasets were mapped to a common projection and plotted together.
2. The top two quartiles of sensitive population exposure data were plotted as shaded grid cells.
3. The top quartile of emissions was plotted as outlined grid cells.
4. The poverty level data were plotted as shaded block-group polygons.

5. Poverty-level polygons that intersect high (top 50%) exposure cells and are within one grid cell of a high emissions (top 25%) cell were used to identify impacted areas.

6. Boundaries were constructed along major roads or highways that encompass nearby high emission cells and low income areas.

7. Knowledge of local areas was used to make judgments in selecting bounding roadways, recognizing that emissions, modeling, demographic data may not perfectly reflect true conditions.

4. RESULTS

This designation method identified the following six areas as Priority Communities:

1. Portions of the City of Concord;

2. Western Contra Costa County (including portions of the Cities of Richmond and San Pablo);

3. Western Alameda County along the Interstate-880 corridor (including portions of the Cities of Berkeley, Oakland, San Leandro, San Lorenzo, Hayward;

4. Portions of the City of San Jose.

5. Eastern San Mateo County (including portions of the Cities of Redwood City and East Palo Alto); and

6. Eastern portions of the City of San Francisco;

These Priority Communities are more specifically identified in the attached maps. The first two figures illustrate all six of the Bay Area Priority Communities on a single map: the first shows each Priority Community as a color-shaded polygon, while the second figure identifies each Priority Community by a colored boundary line and includes plots of the income, emissions, and exposure databases that were used to identify each Priority Community. The following six figures identify each Priority Community's boundary lines in closer detail.

Priority Communities

21

6

3

5

4

Legend

Major Airports

Revised Priority Community Boundary

Concord

Richmond/San Pablo

Western Alameda County

San Jose

Redwood City/East Palo Alto

Eastern San Francisco

01234Miles

March 25, 2009

Lau.../Grant communities.mxd

Exposure to Toxic Air Contaminants of Sensitive Populations in Bay Area Counties in the Year 2005 Based on a Weighted Product of Population and Emissions

Solano

Sacramento

Marin

Contra Costa

San Francisco

Alameda

Legend

Major Airports

>40% living with income under 185%FPL Top

Quantile Emission Sources **San Mateo** Top

25% Quartile of TAC Exposure Next 25%

Quartile of TAC Exposure

Revised Impacted Community Boundary

Concord Eastern San

Francisco

Western Alameda County

Redwood City/East Palo Alto

Richmond/San Pablo

San Jose

Santa Clara

01.53 6 912

Miles

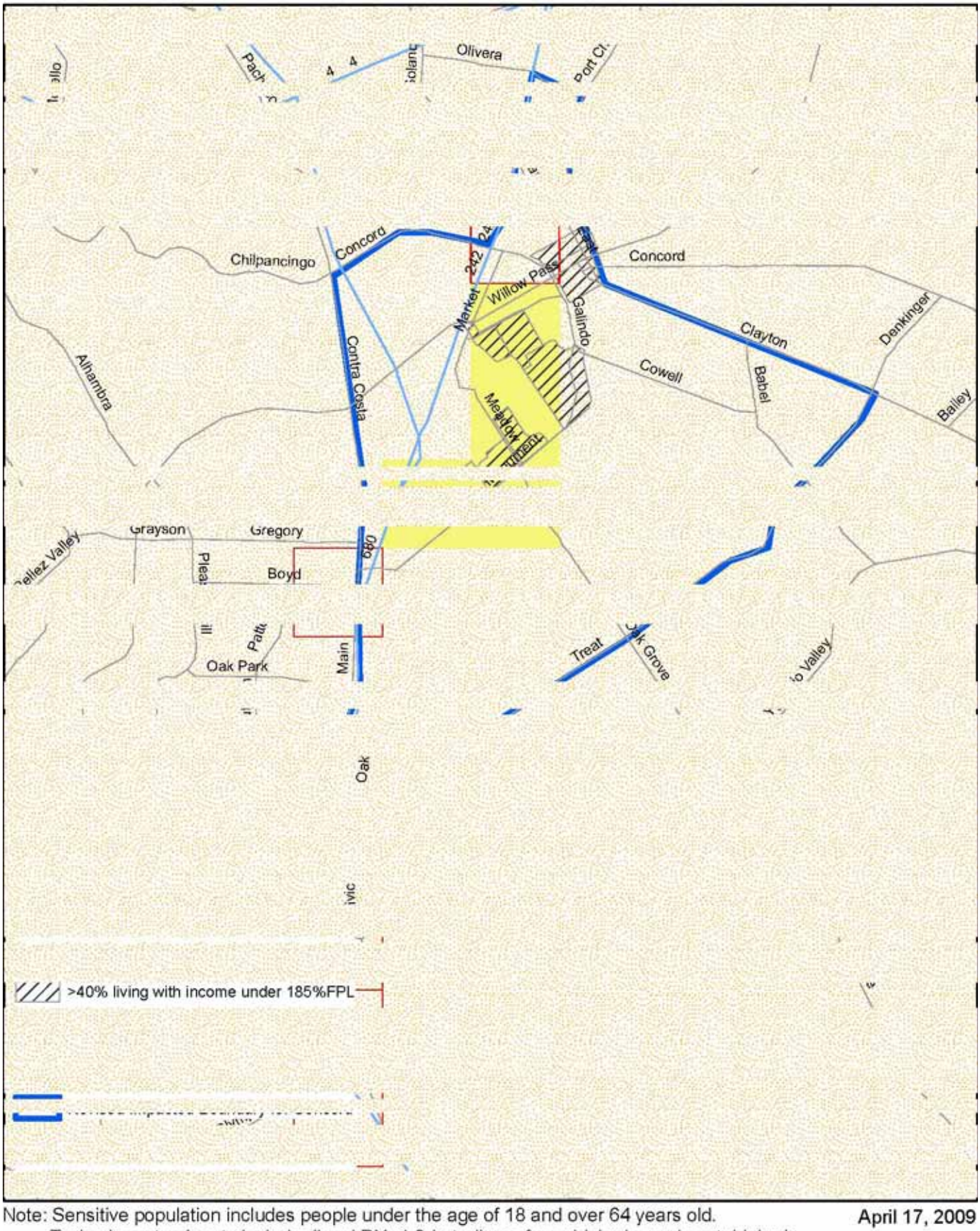
Santa Cruz

Note: Sensitive population includes people under the age of 18 and over 64 years old. April 17, 2009 Toxic air contaminants include diesel PM, 1,3-butadiene, formaldehyde, and acetaldehyde.

ICT

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Exposure to Toxic Air Contaminants of Sensitive Populations in Concord
in the Year 2005 Based on a Weighted Product of Population and Emissions



Note: Sensitive population includes people under the age of 18 and over 64 years old.
Toxic air contaminants include diesel PM, 1,3-butadiene, formaldehyde, and acetaldehyde.

April 17, 2009

Oa
k

vici

Exposure to Toxic Air Contaminants of Sensitive Populations in Richmond/San Pablo in the Year 2005 Based on a Weighted Product of Population and Emissions

Marin

Contra Costa

Sanford

Macdonald

Legend

Marin

Major Airports >40% living with income under 185%FPL

Top Quantile Emission Sources

Top 25% Quartile of TAC Exposure

Next 25% Quartile of TAC Exposure

Rvised Impacted Boundary for Richmond

Alameda

Marin

San Francisco

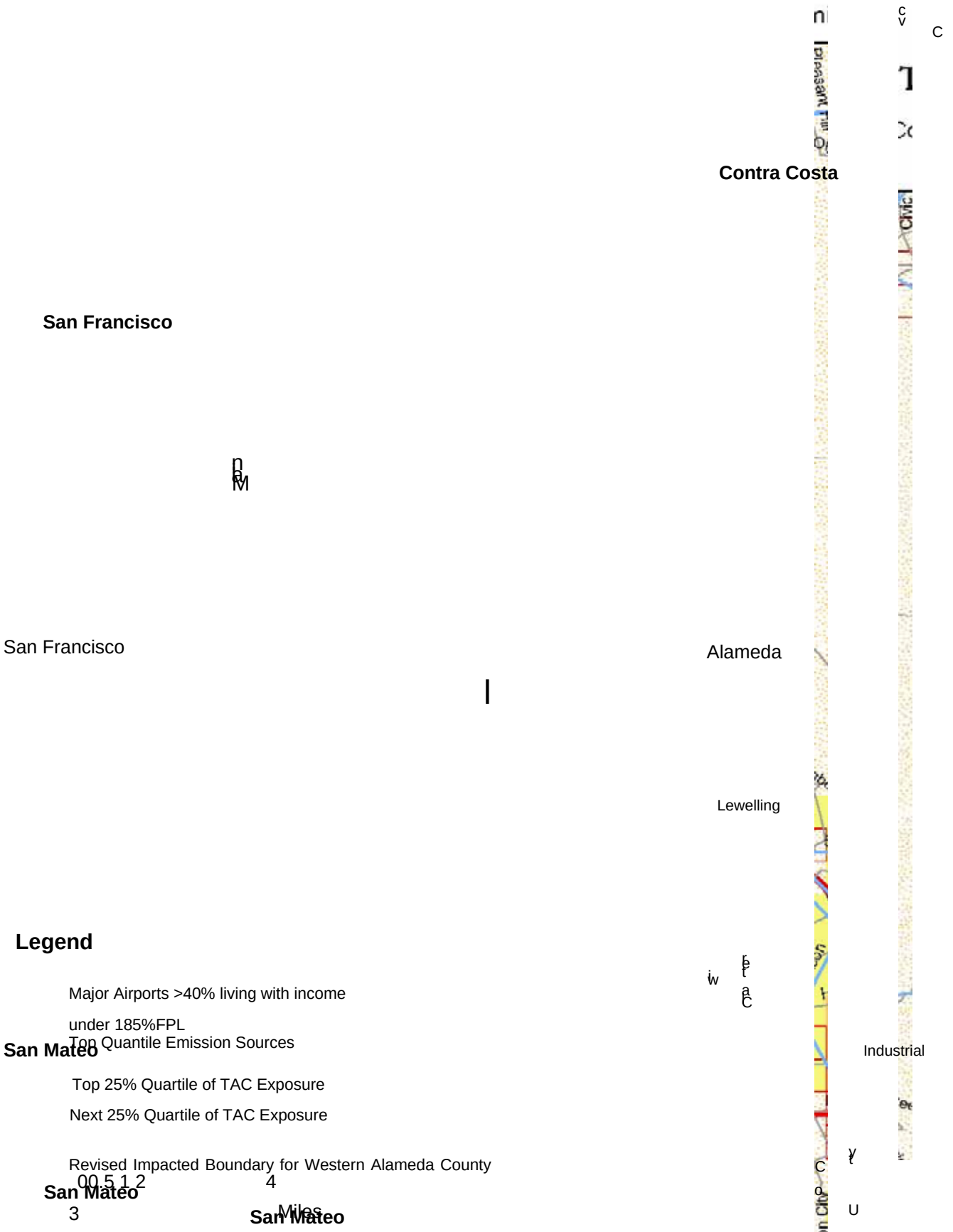
0 0.3 0.6 1.2 1.8 2.4

Miles Note: Sensitive population includes people under the age of 18 and over 64 years old.

Toxic air contaminants include diesel PM, 1,3-butadiene, formaldehyde, and acetaldehyde.

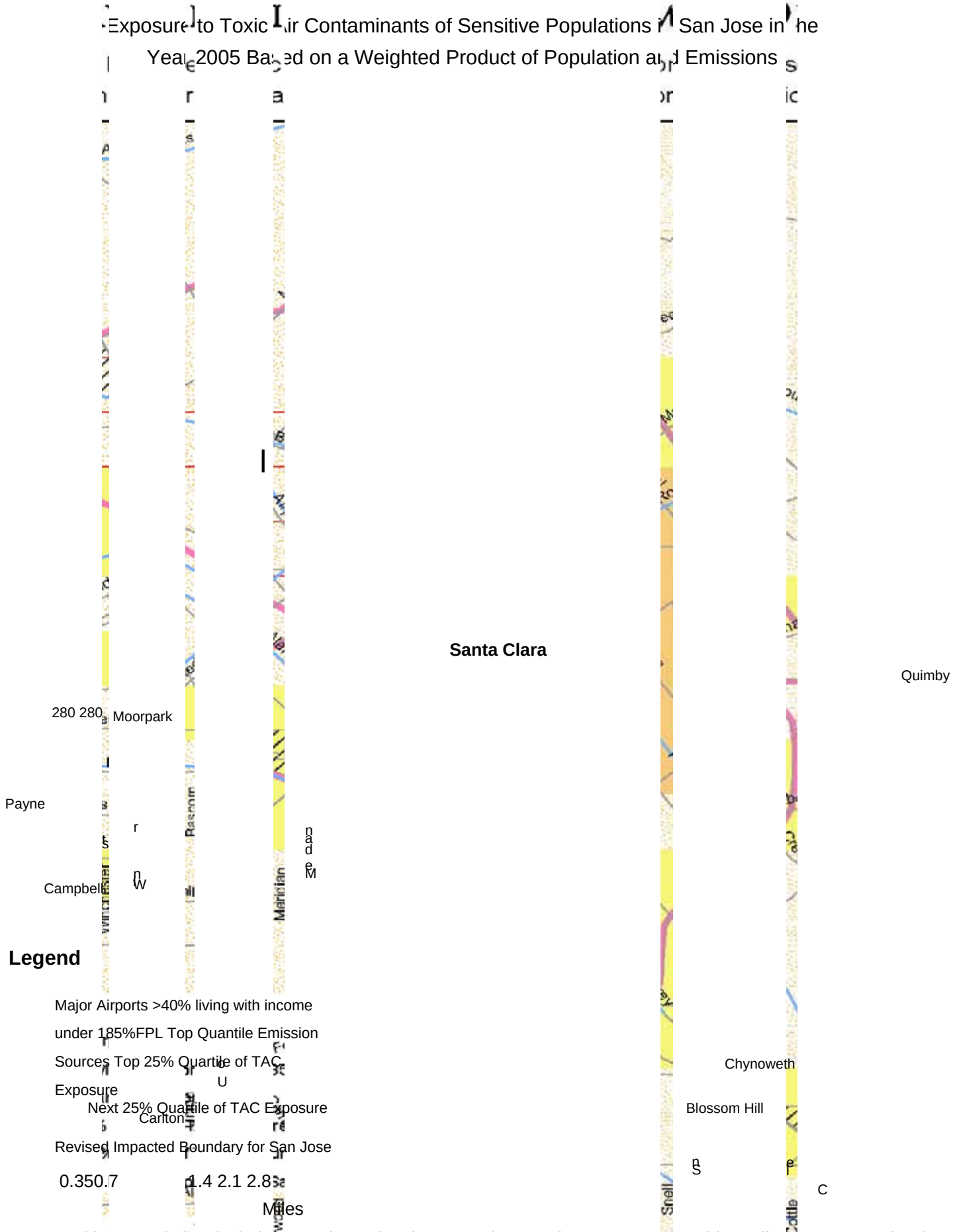
April 17, 2009

Exposure to Toxic Air Contaminants of Sensitive Populations in Western Alameda County in the Year 2005 Based on a Weighted Product of Population and Emissions



Note: Sensitive population includes people under the age of 18 and over 64 years old. April 17, 2009 Toxic air contaminants include diesel PM, 1,3-butadiene, formaldehyde, and acetaldehyde.

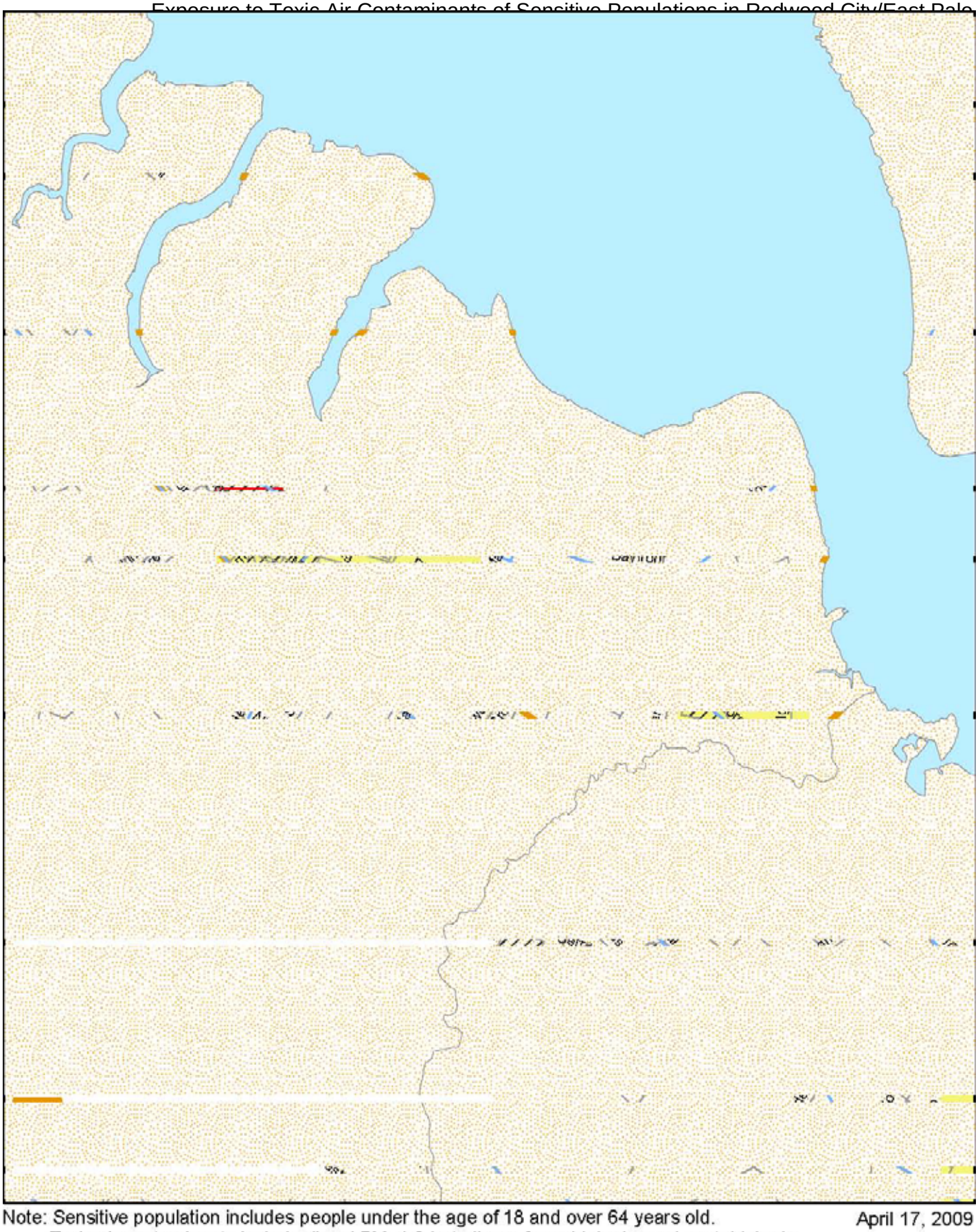
Exposure to Toxic Air Contaminants of Sensitive Populations in San Jose in the Year 2005 Based on a Weighted Product of Population and Emissions



Note: Sensitive population includes people under the age of 18 and over 64 years old. April 17, 2009 Toxic air contaminants include diesel PM, 1,3 butadiene, formaldehyde, and acetaldehyde.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

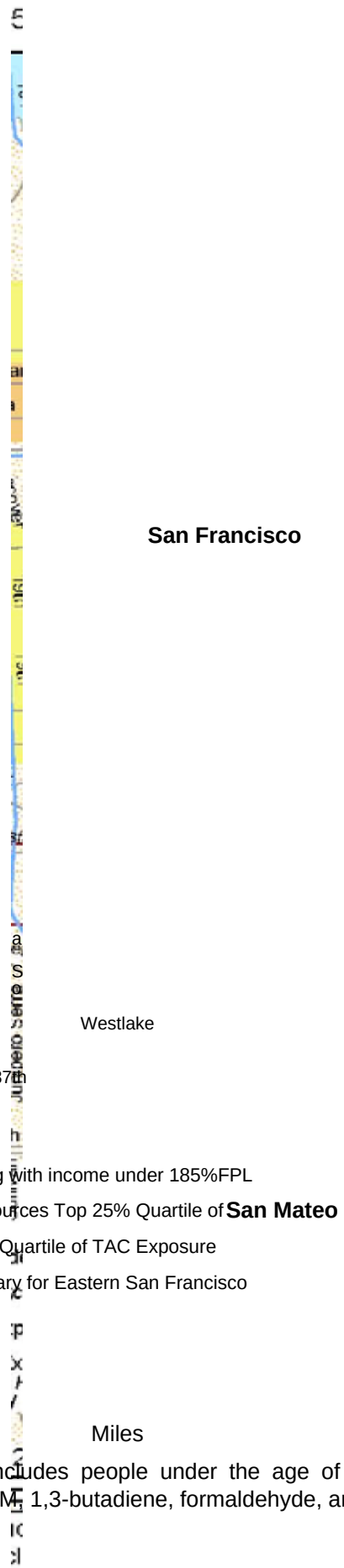
Exposure to Toxic Air Contaminants of Sensitive Populations in Redwood City/East Palo Alto



Note: Sensitive population includes people under the age of 18 and over 64 years old.
Toxic air contaminants include diesel PM, 1,3-butadiene, formaldehyde, and acetaldehyde

April 17, 2009

Exposure to Toxic Air Contaminants of Sensitive Populations in San Francisco in the Year 2005 Based on a Weighted Product of Population and Emissions



Legend

Major Airports >40% living with income under 185%FPL

Top Quantile Emission Sources Top 25% Quartile of

TAC Exposure Next 25% Quartile of TAC Exposure

Revised Impacted Boundary for Eastern San Francisco

0 0.3 0.6 1.2 1.8 2.4

Miles

Note: Sensitive population includes people under the age of 18 and over 64 years old. April 17, 2009 Toxic air contaminants include diesel PM, 1,3-butadiene, formaldehyde, and acetaldehyde.

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix D:

Ambient Toxics Trends

David Fairley
Planning and Research Division

October 2009

Ambient toxic trends
David Fairley

The BAAQMD and ARB have tracked selected toxic pollutants since the late 1980s. There are no ambient standards for these pollutants, but they do have known health risks either for cancer or for other acute or chronic health problems. Table 1 presents the compounds that have been measured for a significant amount of time, showing the first year sufficient data were available, and the annual percent reduction, where possible. The trend for a compound was estimated using the ratio of an estimate of the District mean based on the most recent available 5 years of data (usually 2002-06) with the earliest 5 years. BAAQMD sites were used where possible.

With some exceptions, ambient toxic compounds in the Bay Area have been reduced substantially. Reformulated fuels have reduced concentrations of benzene and 1,3-butadiene. MTBE has been eliminated from gasoline. Perchloroethylene has been reduced dramatically because of state and BAAQMD dry cleaner rules. Cleaner-burning diesel engines and cleaner diesel fuel have reduced diesel concentrations over 50%. Carbon tetrachloride is one exception, showing essentially no change. This pollutant is no longer manufactured but is long-lived in the atmosphere and ubiquitous world-wide. A second exception is chloroform, which has shown a 16% increase since the late 1980s. Formaldehyde and acetaldehyde show reductions of 14% and 8% respectively from 1996-98 to 2003-05. It is not clear that these represent statistically significant reductions.

Data and Methods

Data are collected on an every 12th day schedule. For this analysis, a year was assumed to have sufficient data if there were at least 5 observations in each calendar quarter. For site/years meeting this criterion, the annual means were computed from the quarterly averages.

To determine trends, the following procedure was used. Sites were used if they had measurements in more than half the years that compound was measured at some site. Missing years were filled using a program that assumes annual mean vectors follow a multivariate normal distribution. The District average was computed for each year. If 7 or more sites were available, a trimmed mean was used – where the highest and lowest mean for that year were discarded. Otherwise, a simple arithmetic mean was used. Then regression lines were fit to the natural logs of District mean for the earliest 5 or 6 years and the most recent 5 or 6 years, and predictions for the earliest year p_e, and the most recent year, p_r, computed. The total change was estimated to be $T = e^{p_r - p_e}$. The annual percentage trend was estimated as $100*[1 - t^{1/(r-e)}]$.

The log scale was used because it affords more straightforward estimates of uncertainty. Namely a 90% confidence interval can be formed as $100*[1 - L^{1/(r-e)}]$ to $100*[1 - U^{1/(r-e)}]$, where $L = e^{p_r - p_e - w}$ and $U = e^{p_r - p_e + w}$, where $w = t_{.05}*s$, with t.05 = the upper 5th percentile of a t-distribution with the appropriate degrees of freedom, and s = an estimate of the standard error of $p_r - p_e$.

Results

Table 1 shows the set of toxics measured, the years of measurement, trend estimates where there is sufficient data. Figure 1 shows estimates of the District means for these toxics for the first and last years of measurement.

Of the toxics for which trend estimation is indicated, substantial progress has been made in all but one case. Except for carbon tetrachloride, the reductions have been statistically significant and the majority of toxics have been reduced more than 50% since the late 1980s as has the toxic risk.

Table 1. Toxic compound trends 1987-2005.

Compound	Years First Measured Routinely		Sufficient Data For Trend Analysis[a]		Annual Percent Change (90% confidence interval)[b]
VOCs:	BAAQMD	ARB	BAAQMD	ARB	
1,1,1-Trichloroethane	1987	1988	+	+	11.3 (10.1, 12.4)
1,3-Butadiene	1994	1989		+	9.5 (8.2, 10.8)
Benzene	1987	1988	+	+	9.6 (8.6, 10.6)
Chloroform	1987	1988		+	
Carbon Tetrachloride	1987	1988	+	+	0.2 (-0.1, 0.5)
Ethylene Dibromide	1987	1988			
Ethylene Dichloride	1987	1988			
MTBE	1996	1998	+	+	>25
Methylene Chloride	1987	1988			5.1 (2.9, 7.2)
Perchloroethylene	1987	1987	+	+	14.9 (13.3, 16.4)
Toluene	1987	1991	+	+	8.2 (7.3, 9.1)
Trichloroethylene	1987	1988			
Vinyl Chloride	1987				
Formaldehyde		1996		+	4.1 (1.8, 6.4)
Acetaldehyde		1996		+	1.9 (0.2, 3.7)
PM10:					
PAHs[c] (toxicity-weighted)		1995-2004		+	5.4 (2.2, 8.4)
Hexavalent Chromium		1991		+	8.5 (6.2, 10.8)
PM2.5:					
Diesel[d]	1987[d]		+		6.2 (4.4, 8.7)
Risk[e]	1990	2005			7.0 (5.3, 9.1)

[a]Sufficient data above the limit of detection & enough years with non-missing data to perform trend analysis.
[b]Comparison of earliest 5 years with 2002-06. Regression lines fit to each 5-year period. The annual reduction from the earliest year to 2006 as predicted by the regression lines is shown in the table.
[c]Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene
[d]Diesel estimated from Coefficient of Haze measurements and elemental carbon measurements. Annual COH means were collected over many years, but there was no observable trend until the beginning of the 1990s.
[e]Estimates of the 2006 risk compared with the 1990 risk.
[f]MTBE concentrations are now below the limit of detection making a calculation of the current mean impossible.

Benzene

Benzene is highly carcinogenic and occurs throughout the Bay Area. Benzene also has non-cancer health impacts. Acute effects include central nervous system symptoms of nausea, tremors, drowsiness, dizziness, headache, intoxication, and unconsciousness.

Current estimates show that most of the benzene emitted in the Bay Area comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Industry-related stationary sources contribute 13 percent of the benzene statewide. The primary stationary sources of reported benzene emissions include petroleum refining, and electricity generation.

Figure 2a shows Bay Area benzene trends. In earlier years, there was substantial variation in benzene concentrations, with high levels in areas with heavy traffic. However, the reductions have been dramatic: for example, the California Air Resources Board adopted new fuel standards that by 1996 reduced the benzene content in gasoline for motor vehicles by greater than 50% and accelerated the downward trend in benzene concentrations. CARB also implemented numerous changes to regulations mandating more effective vapor recovery equipment for gasoline stations. Attrition of older motor vehicles has also reduced benzene in tailpipe emissions. In 1987, all non-background sites had mean concentrations over 1.0 ppb. By 2006, no site had mean concentrations above 0.5 ppb, and many had values below what the Fort Cronkite "background" registered in the late 1980s. Regression lines are shown in red, estimating a mean concentration of 1.8 ppb in 1987 compared with 0.26 ppb by 2006. The average Bay Area risk dropped from 144 cases/million to 24 cases/million, a reduction of over 80%.

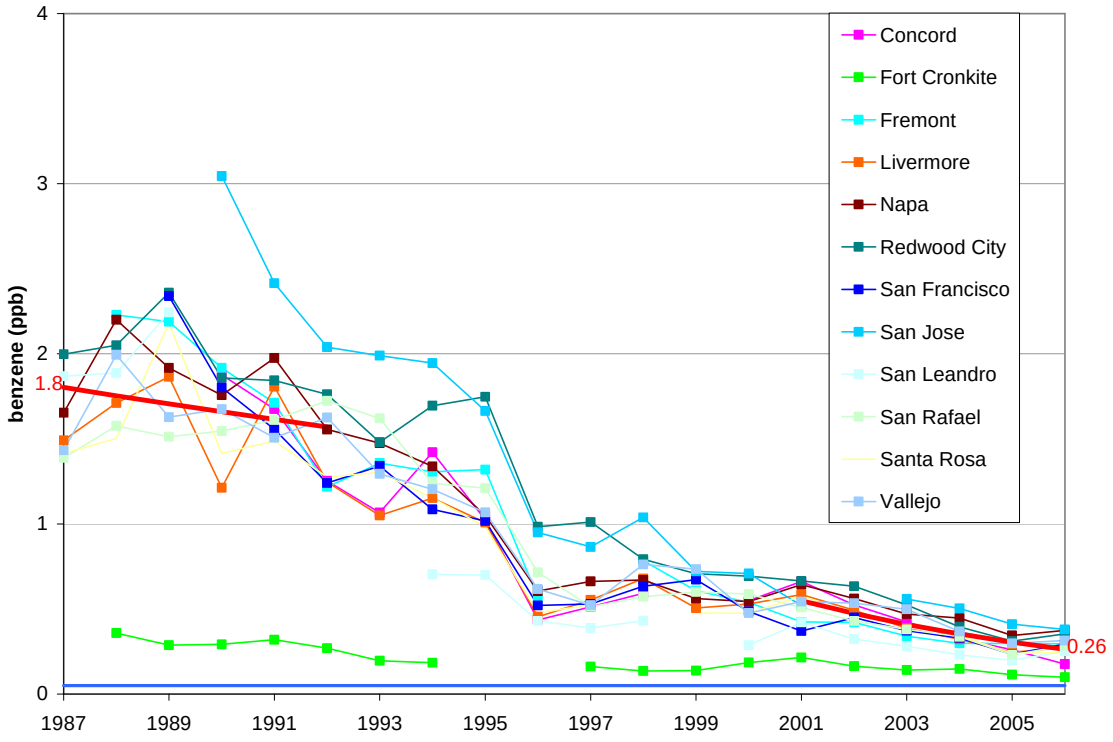


Figure 2a. Annual benzene concentrations at Bay Area sites.

1,3-Butadiene

1,3-butadiene is another carcinogen, with similar origins to benzene, namely mainly from gasoline evaporation and motor vehicle exhaust, with some benzene also coming from petroleum refining and electricity generation. CARB fuel standards also mandated reductions in 1,3-butadiene content in gasoline by 1996.

Long-term 1,3-butadiene measurements were only available from ARB. Figure 2b shows the trend from 1989 through 2006. Also shown are regression lines and estimated means: 0.37 ppb for 1989, and 0.07 ppb for 2006, a reduction of over 80%. The reduction in cancer risk was 131 cases/million in 1990 vs. 25 cases/million in 2006, very similar to that for benzene. This is because, although the 1,3-butadiene concentrations are lower than benzene, the cancer risk per unit concentration is correspondingly higher.

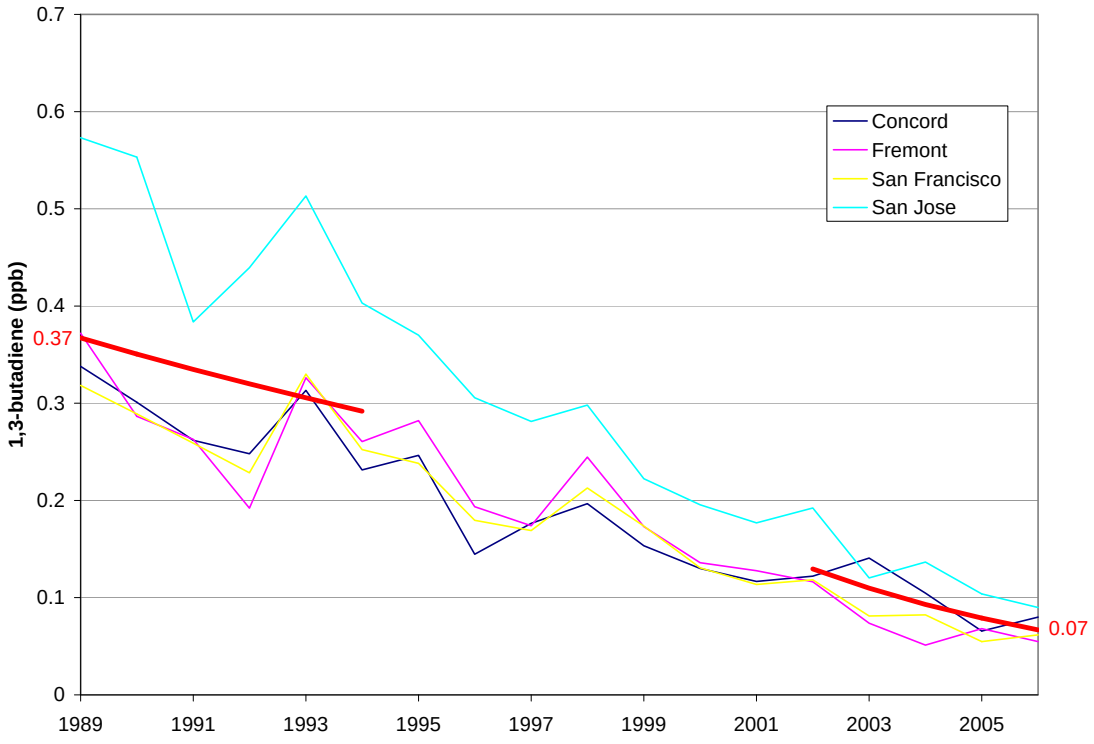


Figure 2b. Annual 1,3-butadiene at Bay Area sites.

Carbon Tetrachloride

Virtually no carbon tetrachloride is being emitted today in the Bay Area. Concentrations represent a global background. Carbon tetrachloride was used in the early 20th century as a dry cleaning solvent and a refrigerant. However it has been found to have serious health effects, including affecting the central nervous system and degenerating the liver and kidneys. It is also a carcinogen, so it was banned in consumer products in the US in 1970, but continued to be used to manufacture Freon.

Carbon tetrachloride itself is a stratospheric ozone depleter. It was among the chemicals scheduled for phase-out by 1996 by the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer. However, its atmospheric lifetime is approximately 50 years, thus much carbon tetrachloride remains.

Figure 2c shows Bay Area carbon tetrachloride concentrations from 1987 through 2006. There has literally been no trend in the concentrations over that time though it does show a modest reduction from early 1990s concentrations, perhaps reflecting global restrictions on production. Also note that Fort Cronkite concentrations are similar to those at other Bay Area sites, reflective of the fact that carbon tetrachloride in the Bay Area derives from a global background.

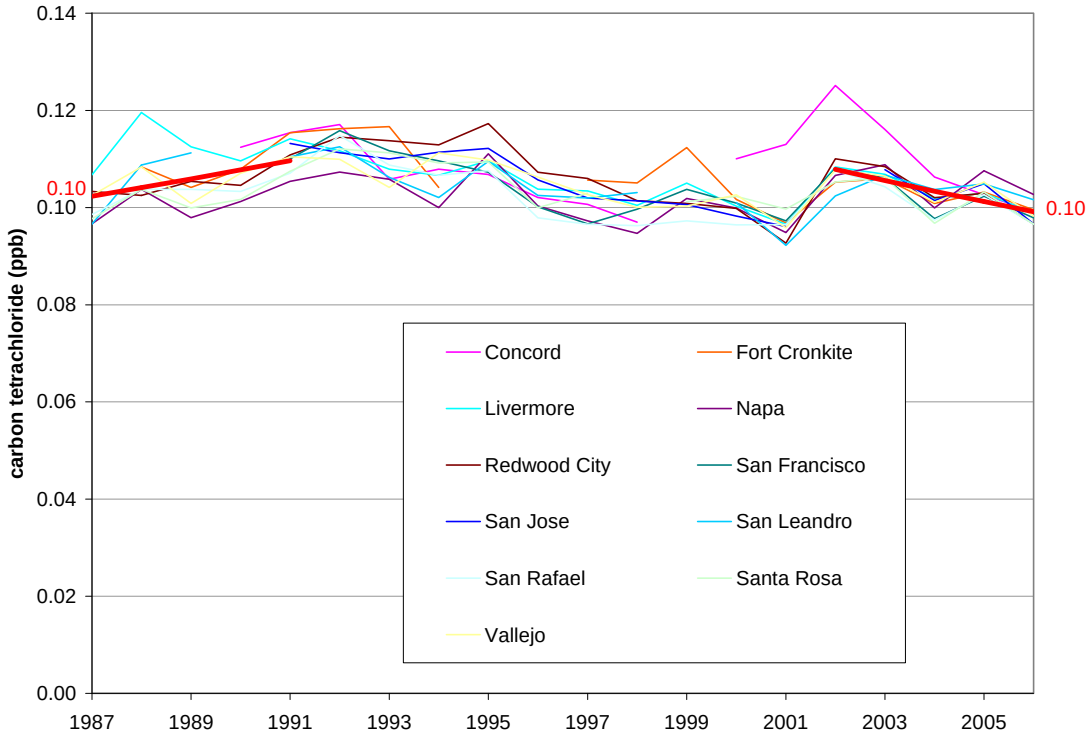


Figure 2c. Annual carbon tetrachloride concentrations at Bay Area sites.

Formaldehyde

Formaldehyde is a carcinogen as well as causing respiratory symptoms and eye, nose, and throat irritation. Although formaldehyde is emitted directly as a result of incomplete combustion, its major Bay Area source, like ozone, is photochemical oxidation.

Figure 2d shows Bay Area formaldehyde concentrations from 1996 to 2006. There has been a statistically significant reduction of approximately one-third.

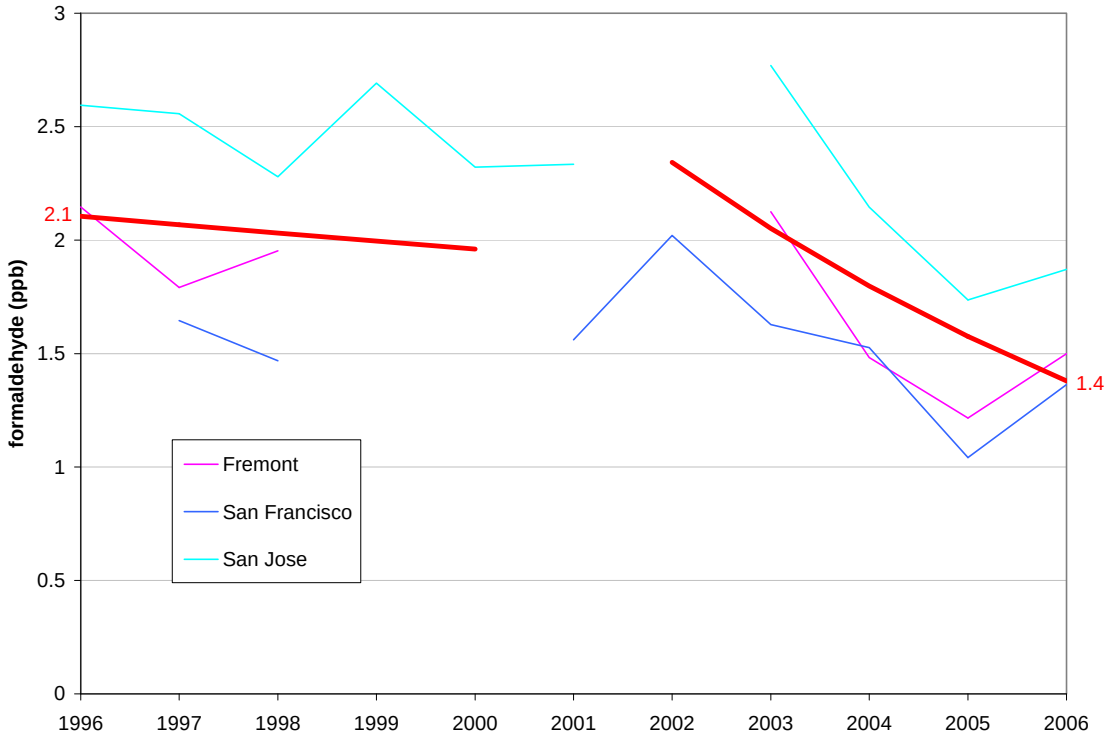


Figure 2d. Annual formaldehyde concentrations at Bay Area sites.

Acetaldehyde

Acetaldehyde is similar to formaldehyde in that it is emitted directly, mainly from motor vehicles, but more is produced as a result of photochemical reactions in the atmosphere. Its health effects are also similar to formaldehyde, namely it is a carcinogen, and can cause irritation of the eyes, skin, and respiratory tract.

Figure 2e shows Bay Area acetaldehyde trends. There has been a modest, but statistically significant decrease in concentrations of roughly 20% from 1996 to 2006.

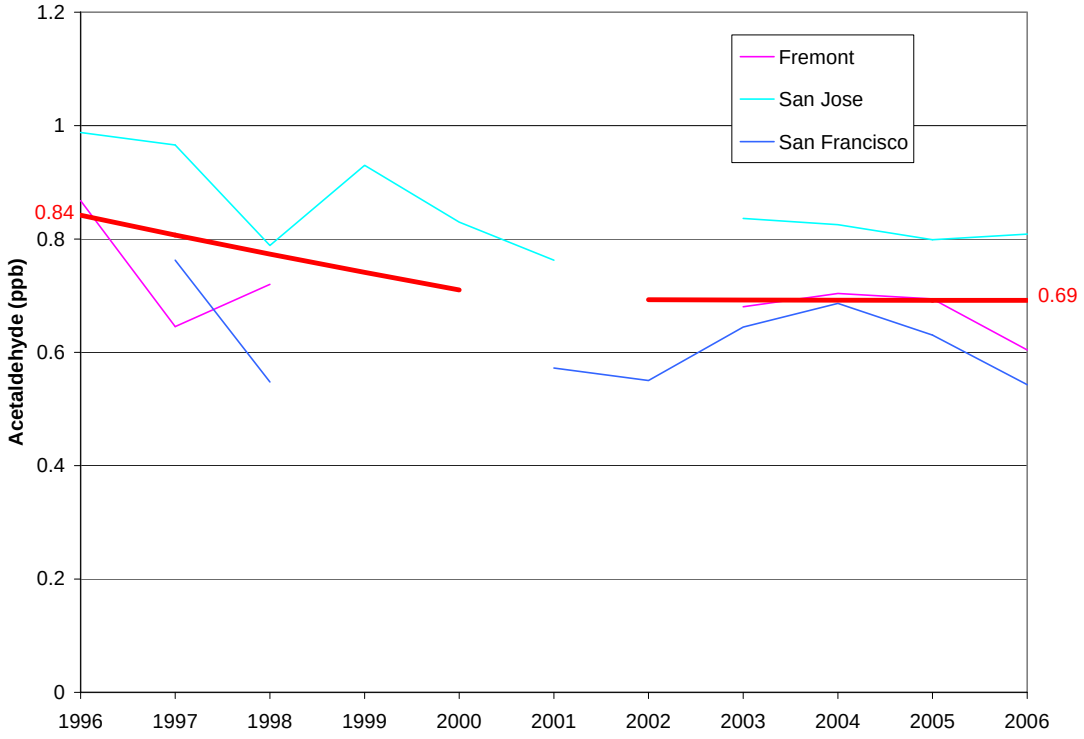


Figure 2e. Annual acetaldehyde concentrations at Bay Area sites.

Methyl tert-butyl ether (MTBE)

Methyl tert-butyl ether, more commonly known as MTBE has been most frequently used as a gasoline additive. In the 1990s it was used to satisfy regulatory requirements for an oxygenate additive to promote more complete combustion. Unfortunately, MTBE is both an air and a water contaminant and, after considerable public outcry, its use was gradually phased out. In 2003, California was the first state to start replacing MTBE with ethanol.

Acute exposure of humans to high concentrations of MTBE can result in nausea, vomiting, dizziness, and sleepiness. Direct exposure to the skin and eyes can cause drying and irritation. It has been shown to cause cancer in tests on lab animals.

Figure 2f shows Bay Area MTBE levels since 1996. Note that concentrations have been completely below the 0.3 ppb LOD since 2004, so that the true mean concentration is unknown.

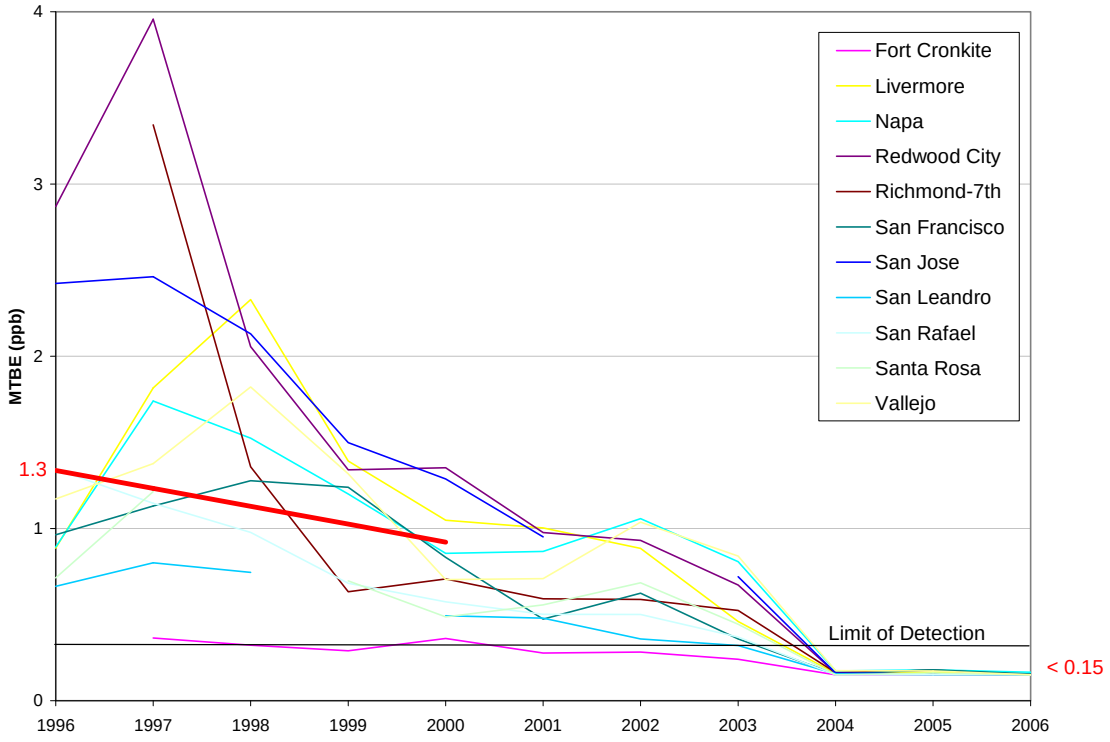


Figure 2f. Annual MTBE concentrations at Bay Area sites.

Perchloroethylene

Perchloroethylene is most commonly used as a solvent. In the BAAQMD 2002 emissions inventory, dry cleaners produced 95% of Bay Area perchloroethylene point source emissions.

Perchloroethylene is a health hazard in several respects. It is a central nervous system depressant that can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Exposure to high concentrations may cause menstrual problems and spontaneous abortions. Workers have shown signs of liver toxicity and kidney dysfunction. It is considered a probable carcinogen by the US EPA, and the state of California has listed it as a carcinogen under the Toxic Air Contaminant Identification Program and for Prop 65. CARB adopted an ATCM in 1993 to reduce emissions from perchloroethylene dry cleaning operations and prohibited its use for automotive brake cleaning and degreasing products in 2001. In 1994, the BAAQMD instituted the nation's most stringent perchloroethylene rule, requiring secondary control machines and vapor barrier rooms.

Figure 2g shows a dramatic reduction in perc concentrations,[1] from an average of 0.37 ppb to 0.02 ppb.

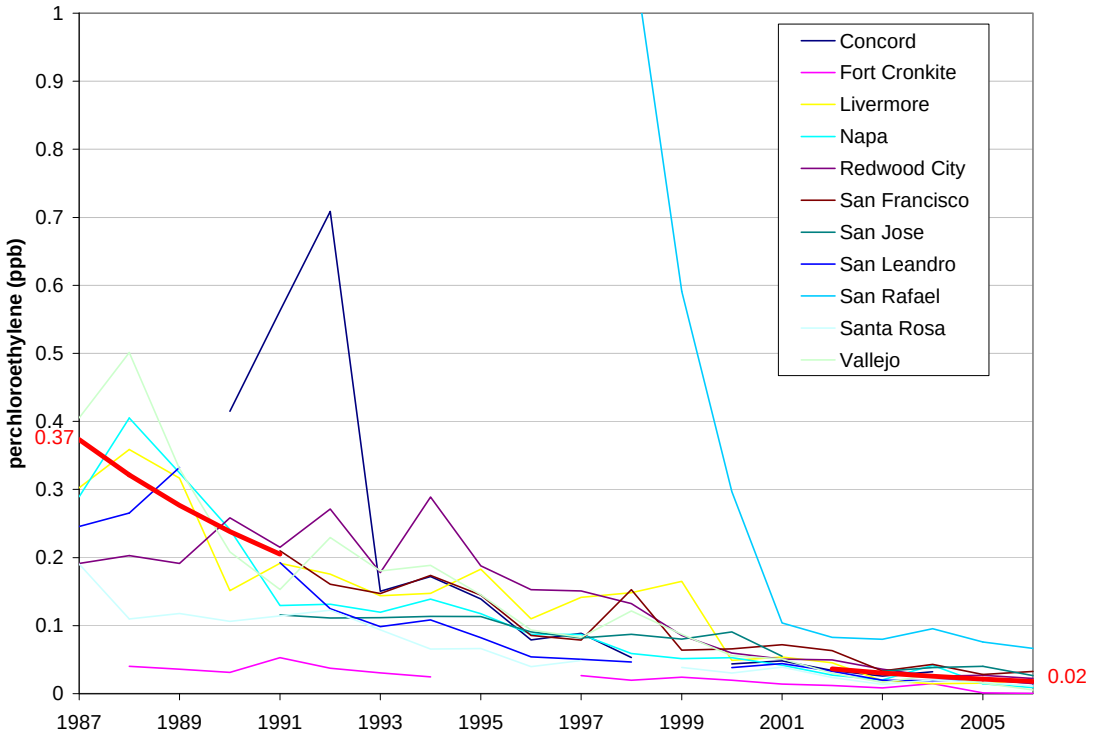


Figure 2g. Annual perchloroethylene concentrations at Bay Area sites. Not shown were San Rafael values were > 1 ppb for 1987-1997.

[1] The Figure shows only perc means ≤ 1 ppb from actual measurements, whereas the regression curves include means using sites with filled-in missing values. In the earliest years, Concord was predicted to have elevated perc levels, which pushed up the trimmed mean.

1,1,1-Trichloroethane (Methyl chloroform)

Methyl chloroform is widely used as an industrial solvent and degreaser, as a dry cleaning agent, as a component of aerosols formulations, and as a coolant and lubricant in metal cutting oils. In the 2002 emissions inventory, the largest Bay Area point source was the American Brass and Iron Foundry in Oakland. Methyl chloroform is considered a stratospheric ozone depleter and its use is being phased out.

Methyl chloroform is a central nervous system depressant, and is mildly irritating to the eyes and respiratory system in humans. Acute inhalation exposure in humans may cause hypotension, mild hepatic effects, dizziness, nausea, vomiting, diarrhea, and respiratory arrest. It is not considered a carcinogen by US EPA.

Figure 2h shows 1,1,1-trichloroethane concentrations at Bay Area sites for 1987 through 2006. There has been a large decrease in that period, from 0.42 ppb to 0.04 ppb, a reduction of approximately 90%, although there are individual sites exhibiting considerably higher concentrations.

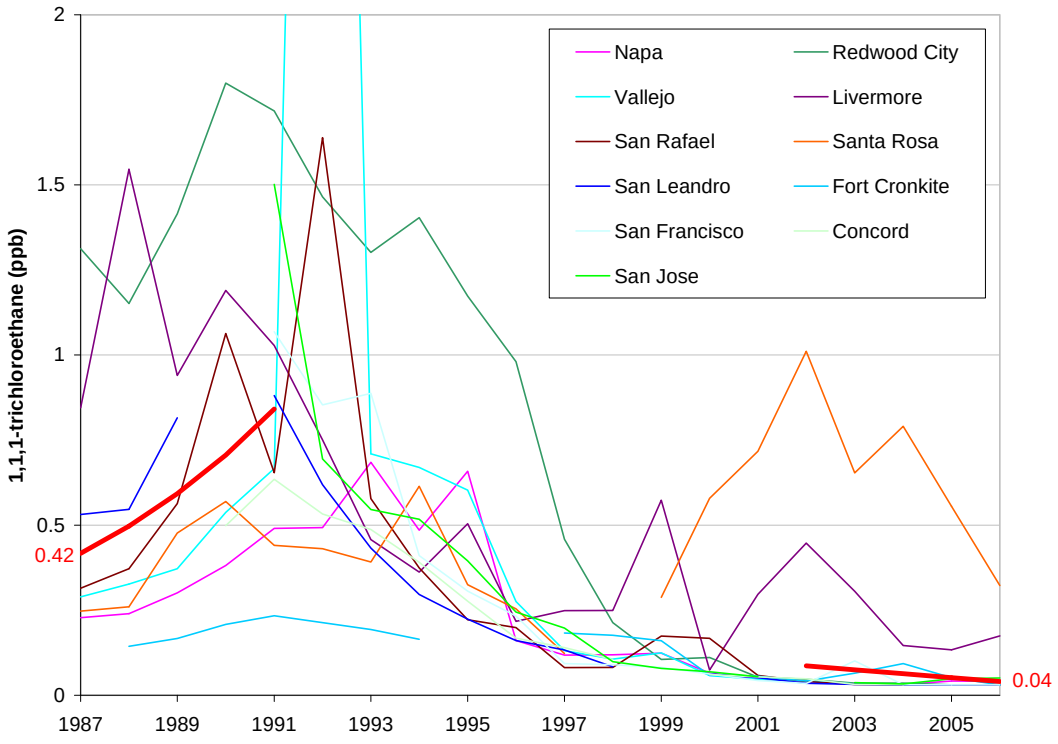


Figure 2h. Annual 1,1,1-trichloroethane concentrations at Bay Area sites. Not shown were Vallejo values were > 2 ppb for 1992.

Toluene

Gasoline evaporation and tailpipe emissions are the major sources of ambient toluene in the Bay Area. Toluene occurs naturally as a component of crude oil and is produced in petroleum refining operations. It is used in household aerosols, nail polish, paints and paint thinners, lacquers, rust inhibitors, adhesives, and solvent based cleaning agents. Toluene is also used in printing operations, leather tanning, and chemical processes.

In the 2002 emissions inventory, the main point sources were the Chevron Products Company, auto body shops, and landfills.

"Dysfunction of the central nervous system and narcosis are the major effects of acute exposure to toluene. Irritation of the skin, eye, and respiratory tract can also result." (OEHHA 1999)

Figure 2i shows annual toluene concentrations at Bay Area sites between from 1987 through 2006. During that time toluene concentrations dropped from about 3.7 ppb to 0.7 ppb, a reduction of about 80%. The figure shows that in 1987, all non-background sites had toluene levels exceeding 2.5 ppb. By 2006, toluene levels were below 1.5 ppb at all sites.

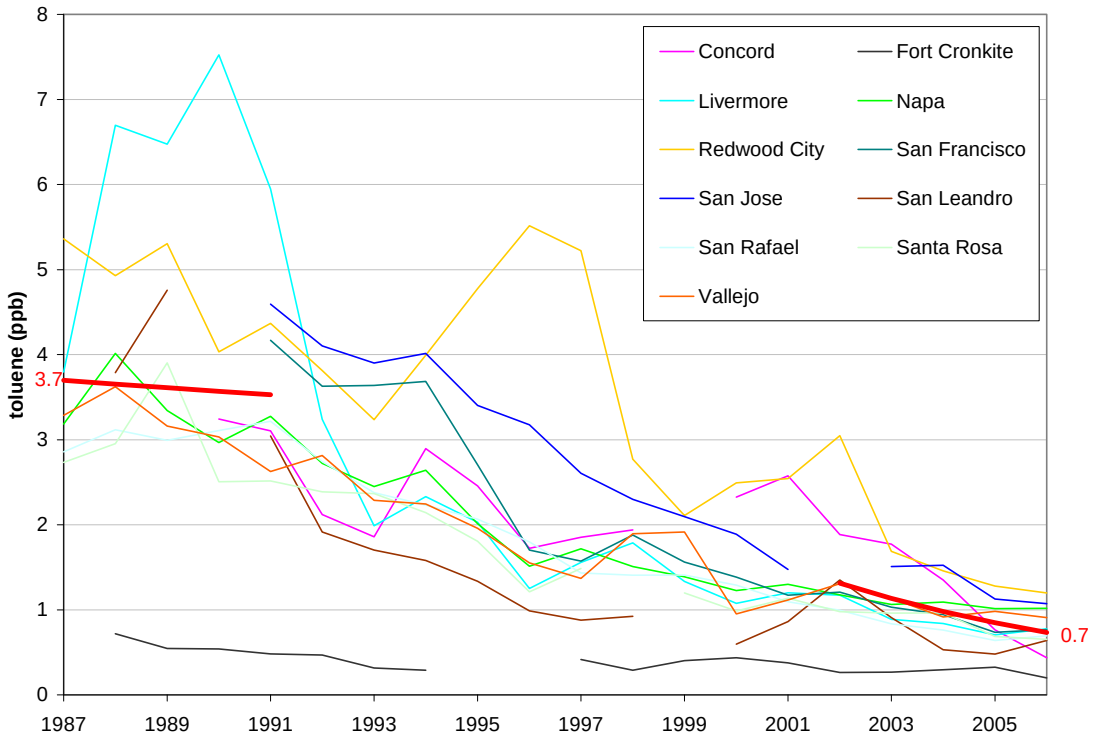


Figure 2i. Annual toluene concentrations at Bay Area sites.

Methylene chloride

"In California, paint removers account for the largest use of methylene chloride, which is the primary ingredient in paint stripping formulations used for industrial, commercial, military, and domestic applications. Because methylene chloride is also a constituent in many consumer products, including aerosol paints and automotive products, short-term indoor concentrations may be several orders of magnitude higher than the ambient concentrations. Many manufacturers of consumer products are voluntarily phasing-out their use of methylene chloride." CARB (2006)

In the Bay Area, the largest point sources are sewage treatment plants, furniture refinishers and landfills.

"Methylene chloride vapor is irritating to the eyes, respiratory tract, and skin. It is also a central nervous system depressant including decreased visual and auditory functions and may cause headache, nausea, and vomiting. At high exposures, methylene chloride can cause pulmonary edema, cardiac arrhythmias, and loss of consciousness. Chronic exposure can lead to bone marrow, hepatic, and renal toxicity." (CARB 1997) Methylene chloride is listed as a probable carcinogen by US EPA, and is on the Prop 65 list of cancer-causing compounds.

Figure 2j shows that, although there were a few exceptionally high annual methylene chloride concentrations, the Bay Area-wide concentrations have declined from 0.83 ppb in 1987 to 0.31 ppb in 2006, decline of 60%.

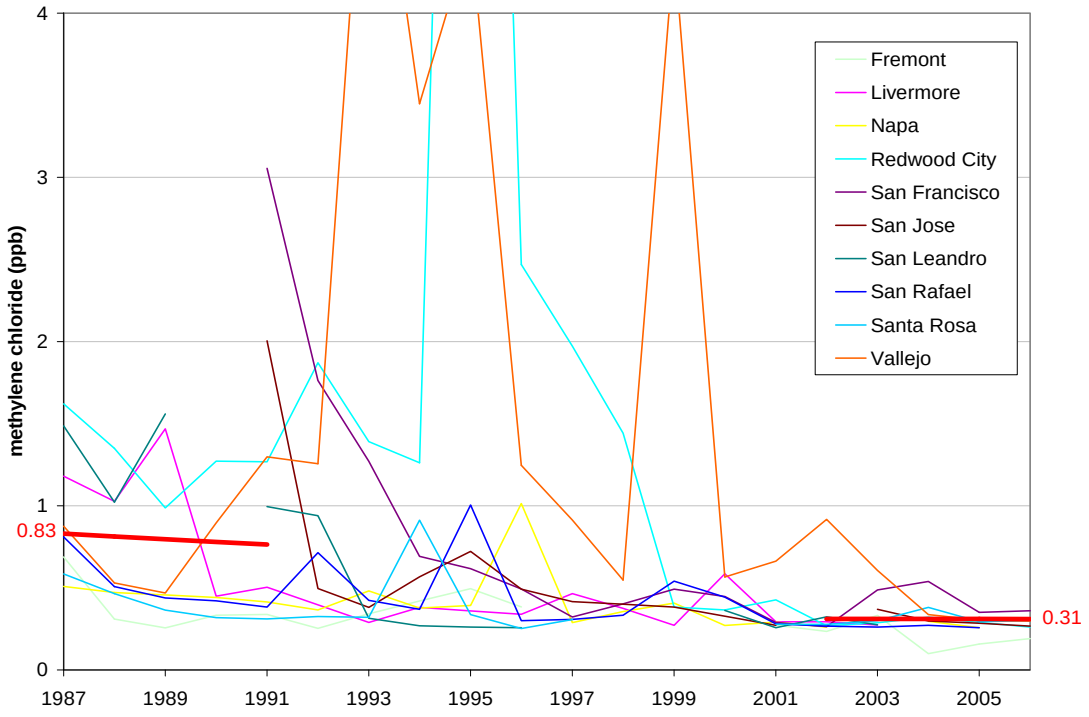


Figure 2j. Annual toluene concentrations at Bay Area sites. Values > 4 pbb at Vallejo and Redwood City not shown.

Polycyclic aromatic hydrocarbons (PAHs)

PAHs are a set of hydrocarbons formed of multiple benzene rings. Several PAHs have been shown to be carcinogenic, the best-studied of which is Benzo(a)pyrene. Although Bay Area PAHs are emitted in petroleum refining, the vast majority derive from fossil fuel and wood combustion.

The set of PAHs that were measured in the Bay Area also included Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene, Indeno(1,2,3-cd)pyrene, and Dibenz(a,h)anthracene. Because both the sources and the health effects of the PAHs are similar, the PAHs have been summed in this analysis, weighted by their relative cancer risk.

Figure 2k shows the toxicity-weighted PAH concentrations from 1995 through 2004. (ARB has since discontinued routine PAHs measurements.) PAH concentrations have been reduced from an average of 0.15 ng/m^3 to 0.09 ng/m^3, a reduction of about 40%.

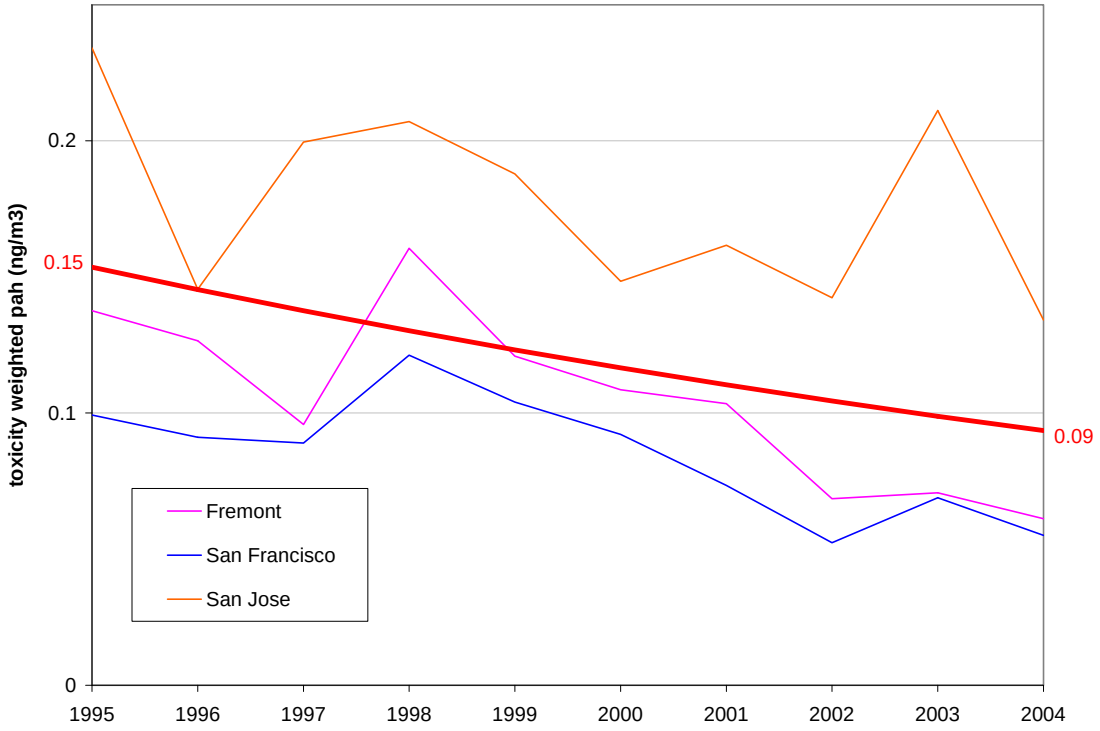


Figure 2k. Annual toxicity-weighted PAH concentrations at Bay Area sites.

Hexavalent Chromium [Chromium (VI)]

The major source of hexavalent chromium in the Bay Area is motor vehicles. Chromium is a trace element in most crude oils, and may oxidize to hexavalent chromium during fuel combustion. Refinery hexavalent chromium emissions constitute about half of all Bay Area point source emissions. CARB adopted several ATCMs to reduce emissions of hexavalent chromium from plating operations (1988), cooling towers (1989), motor vehicle coating (2001), and thermal spraying (2005).

Chromium (VI) is among the larger sources of cancer risk in the Bay Area. Non-cancer effects of chromium (VI) exposure are renal toxicity, gastrointestinal hemorrhage, and intravascular hemolysis.

Figure 2l shows Bay Area chromium (VI) trends. Concentrations were reduced from an average of 0.27 ng/m^3 in 1991 to 0.07 ng/m^3 in 2006, a reduction of nearly 75%.

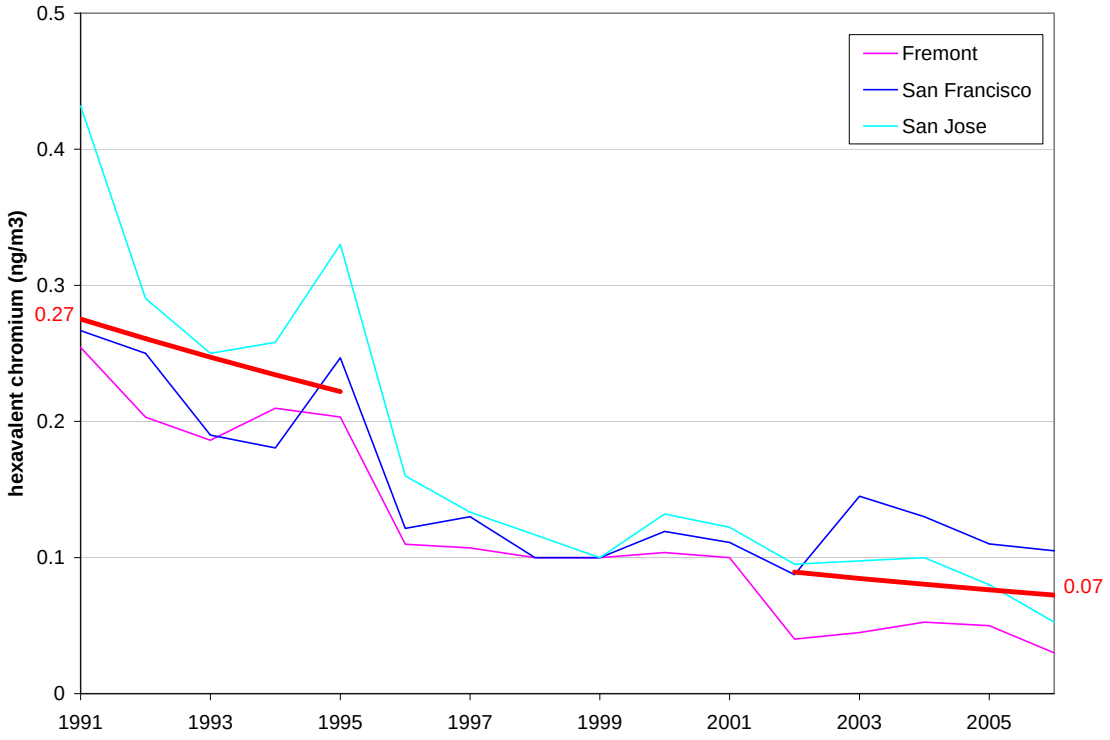


Figure 2l. Annual hexavalent chromium concentrations at Bay Area sites.

Diesel exhaust particulates

Unlike the other toxics in this report, diesel exhaust is not a simple compound (or class of compounds, as are PAHs). It is a complex chemical mixture of gases, semivolatile compounds and particles. A number of diesel components are known carcinogens, including arsenic, benzene, nickel, 1,3-butadiene, benzo(a)pyrene, and formaldehyde. Yet, epidemiological evidence from workers with long exposure to diesel exhaust, as well as animal studies, suggested that the overall carcinogenicity of diesel was much larger than that computed from adding the risks from individual compounds. In other words, it is likely that there is synergy among the components of diesel exhaust that greatly magnifies its carcinogenicity. Based on our current knowledge, it is the largest source of ambient carcinogenicity in the air of the Bay Area.

Diesel fuel is burned in a wide range of sources, but the principal sources in the Bay Area are medium and heavy-duty trucks, and construction equipment.

Another contrast with other compounds discussed here is that diesel exhaust cannot measured directly. A substantial fraction of diesel exhaust is elemental carbon (EC) aka "soot", whereas it is not a large fraction for other major Bay Area $PM_{2.5}$ sources such as wood smoke and gasoline exhaust. Thus, EC is a surrogate for diesel exhaust. EC was measured at a few sites during special studies, but has only been measured rountinely in the Bay Area since mid-2004. Previously, another measurement, coefficient of haze (COH) was made at a number of Bay Area sites.

Figure 2m shows diesel trends estimated from COH and EC. COH values were used through 2003 at all sites except San Francisco, 2004, and Redwood City, 2006. EC measurements were used for 2005 and 2006, otherwise. Estimated Bay Area average diesel exhaust dropped from 3.5 $\mu g/m^3$ in 1987 to 1.15 $\mu g/m^3$ in 2006.

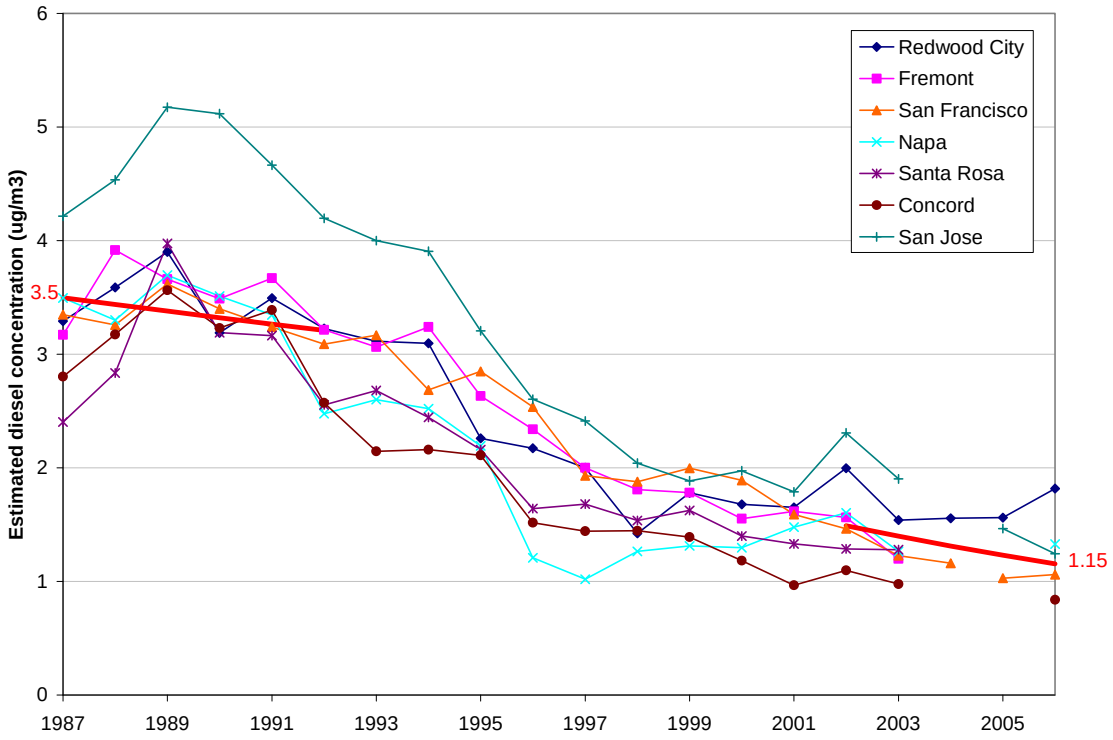


Figure 2m. Estimated diesel concentration trends, 1987-2006. Diesel concentrations for 1987-2003 estimated using COH, also SF for 2004, and Redwood City for 2004-06. Diesel concentrations at SJ 2005-06, Concord 2006, and SF 2005-06 estimated from EC measurements.

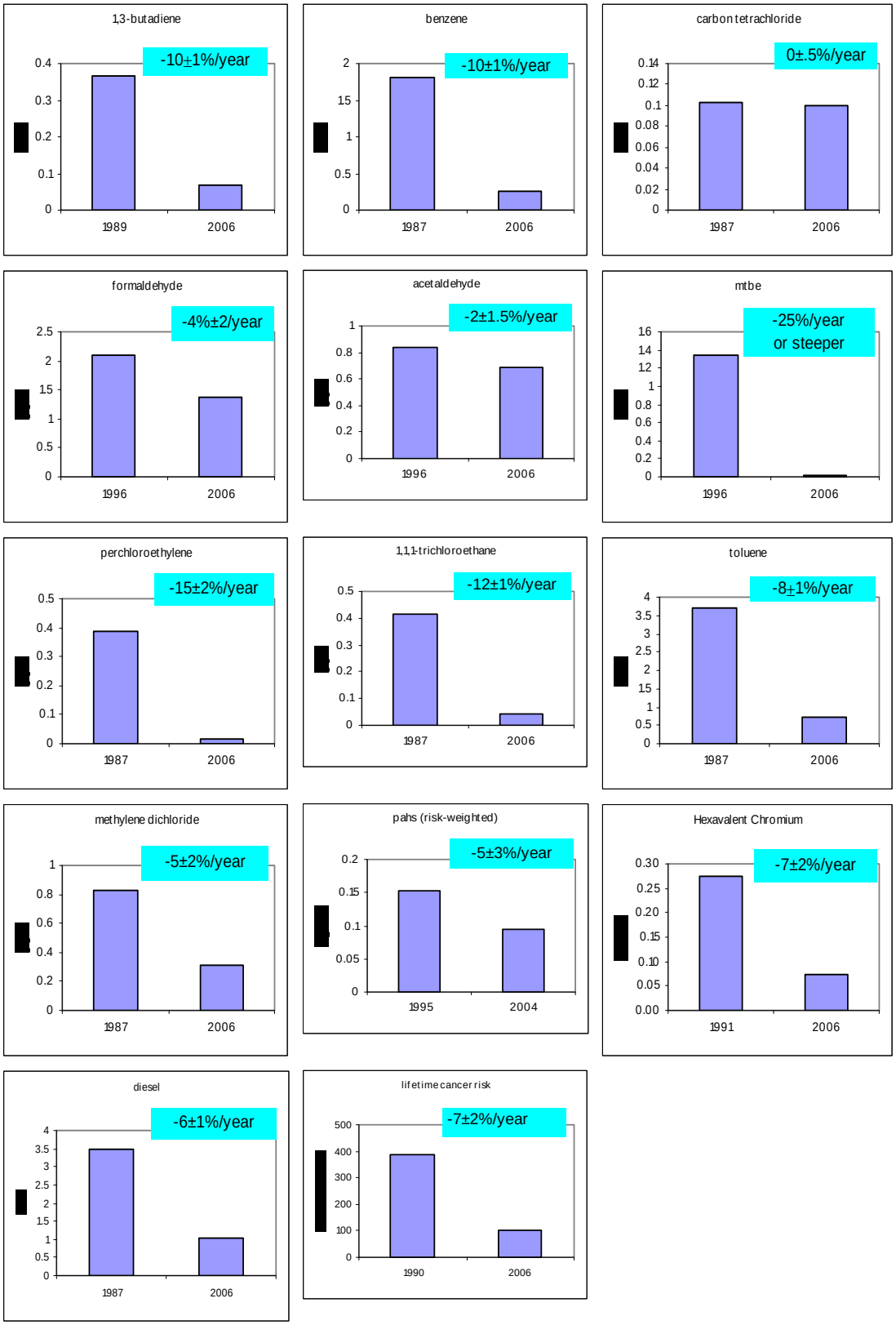
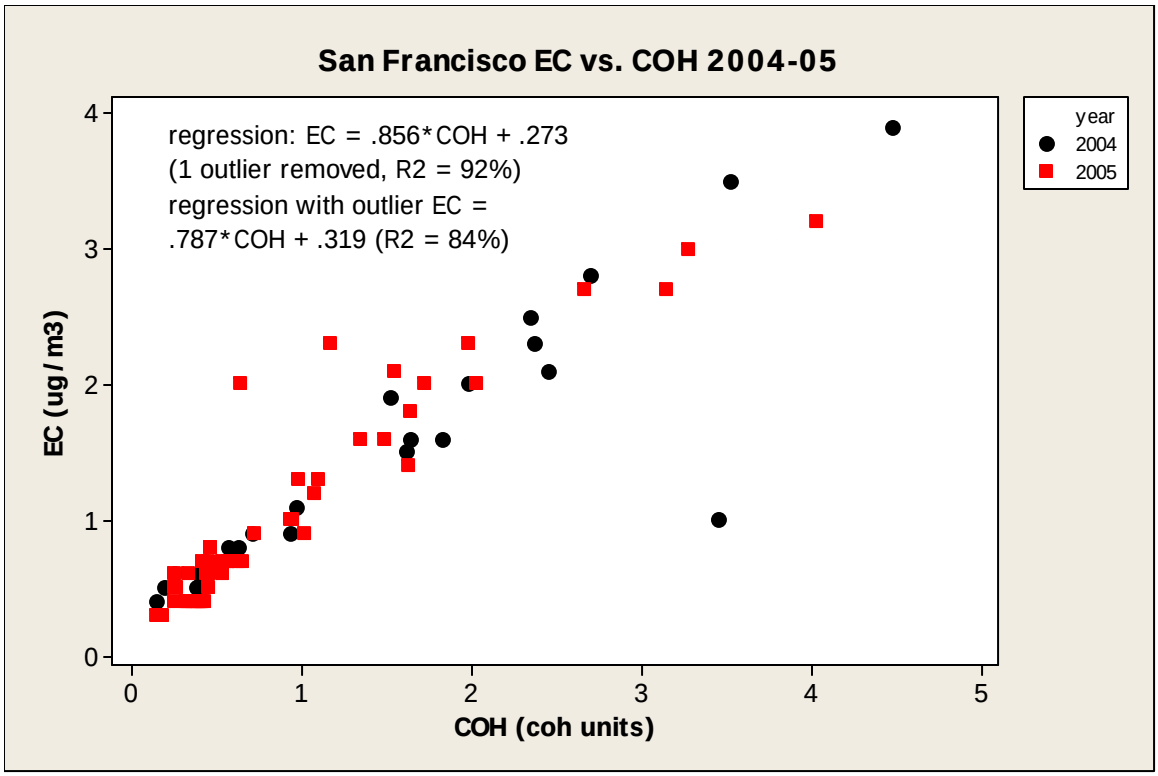


Figure 1. Trends in individual toxics. Bay Area-average concentrations estimated for first and last year with data from sufficient sites. Annual compounded reductions also shown.

Appendix – Estimating diesel emissions and trend

As previously mentioned, ambient diesel measurements do not exist, but a surrogate, elemental carbon (EC), has been measured at several Bay Area sites. The conversion factor from $\mu g/m^3$ EC to $\mu g/m^3$ diesel is 1.04, so that the concentration of $PM_{2.5}$ from diesel is approximately the EC concentration.[2] Unfortunately, routine measurement of EC has only recently begun; previous measurements were made only as part of special studies.

Using the limited matched data (for San Francisco in 2004 and 2005), an equation for estimating EC from COH was developed.[3]



Also shown in Figure 3 are log-scale regressions for 1987-1992 and 2002-2003, 2005-06. The regression predictions are 3.5 $\mu g/m^3$ for 1987 and 1.0 $\mu g/m^3$ for 2006, a reduction of 70%.

[2] The conversion factor comes from a South Coast study. There are other sources of EC, including gasoline exhaust and wood burning. Thus, if these are significant sources in an area, assuming a 1-to-1 ratio may cause diesel to be overestimated.

[3] EC = .856*COH + .273, adjusted R^2 = 92.

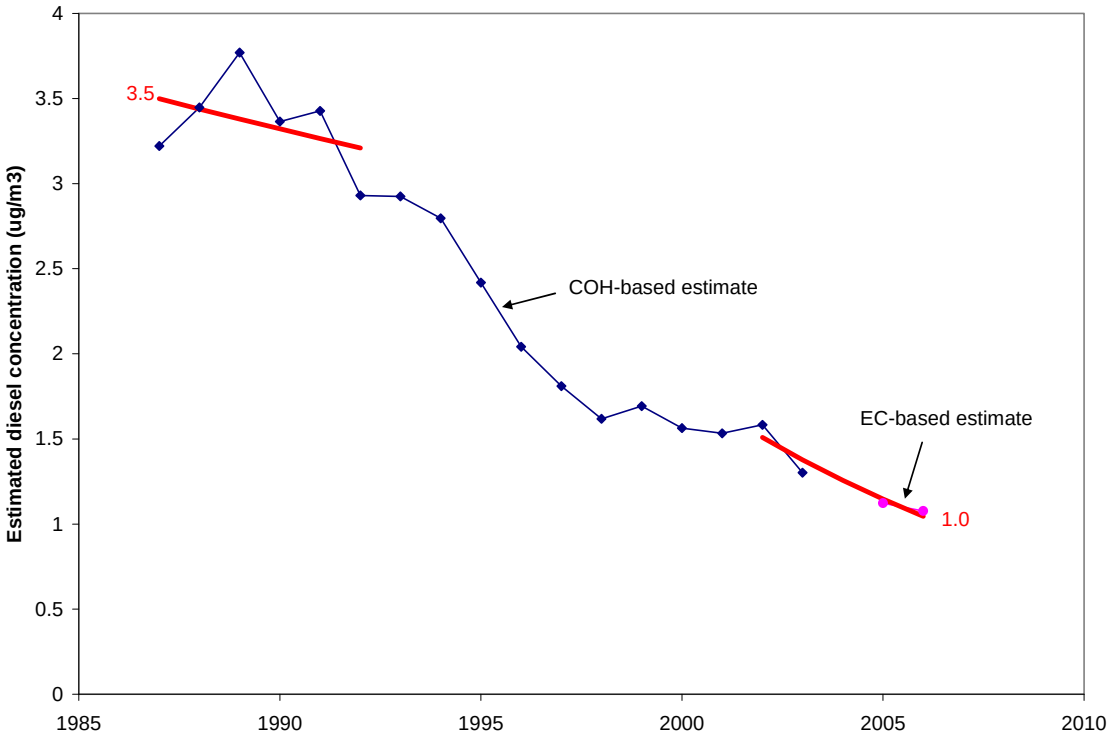


Figure 3. Estimated diesel trend. The values for 1987-2003 are based on the trimmed COH mean of seven sites, using the formula diesel = .854*COH+.275. The values for 2005 and 2006 are based on mean EC at 5 sites, with the assumption diesel = EC.

There is considerable uncertainty in the trend estimate, although more in the absolute level than the relative change. The estimate of diesel involves several levels of estimation – the conversion of EC to diesel, the conversion of COH to EC, and the uncertainty related to the measurements themselves from measurement error, atmospheric variation, and choice of sampling location. Quantifying the effect of these uncertainties on trend is complex. The formula for standard error of the prediction from a regression captures the last source of error but not the other two. The regression error is about 10%. Somewhat arbitrarily I've assigned a 10% error to trend uncertainty caused by the COH/EC conversion, and a 15% error caused by the EC/diesel conversion. Combining the root mean square of these errors yields a total error of 21%.

Estimated Risk Trend

Unit cancer risk values were obtained from OEHHA/ARB 2002. Lifetime cancer risks were estimated based on reductions from 1990 and 2006, using multi-site means from those years except for PAHs, where the 1990 and 2006 means were extrapolated from the estimates for 1995 and 2004; MTBE, where the 1990 mean was assumed to be zero; acetaldehyde and formaldehyde where the 1990 mean was extrapolated from the estimates for 1996 and 2006. The estimated risks were 1,310 in a million for 1990 and 420 in a million for 2006, a reduction of approximately two-thirds.

It should be noted that there is considerable uncertainty in these risks. First, because of detection limitations, several monitored carcinogens are not included, such as hexavalent chromium, vinyl chloride, ethylene dibromide, and ethylene dichloride. However, even using upper bounds for the measurements of these compounds, the additional risks are small relative to the total risk and would not influence the reduction estimate substantially.

A larger source of uncertainty is the diesel risk, which constitutes over 70% of the total risk. There is considerable uncertainty in the absolute concentrations, and hence, in its contribution to each risk estimate. There is also uncertainty in its estimated trend, since the quantities measured to estimate it, EC and COH, are influenced by other sources. Another large source of uncertainty is that there may be other sources where, as with diesel, the total risk is much higher than the sum of the risks from individual components. Possibilities include wood smoke and gasoline exhaust.

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RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix E:

Comments and District's Responses

Summary of Comments for Proposed Amendments for Regulation 2, Rule 5 (2009) & District Responses

***Comment 1:* Interaction with other District proposals?**
The District is developing several new programs and major revisions to existing programs including the 2009 Clean Air Plan and the development and use of the multi-pollutant evaluation method, CEQA Guideline revisions, and an Indirect Source Rule. Is the District considering different standards for different areas in each of these programs? How will these programs interact with each other?

Response 1: *To the extent applicable, similar standards will apply to District programs; however our revised proposals for Rule 2-5 and the CEQA Guidelines no longer include different risk standards in different communities. All District programs will use the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines.*

***Comment 2:* Proposed Revisions do not go far enough. Permits for new and modified sources should be prohibited in the Priority Communities, unless a proposed project would result in a net onsite reduction in emissions, or if the project would meet an urgent community need.**
Although the proposal to set more stringent standards for priority communities is a step in the direction of better air quality for some of Bay Area's more vulnerable communities that have higher air pollution levels, they merely slow the increase of toxics in priority communities, and do not act to fully protect the health of residents. The proposed standard is insufficient to limit new pollution and achieve no net increase, and reductions in cumulative health impacts.

Response 2: *The District has been working closely with OEHHA to understand the effects of newly adopted and pending revisions to the health risk assessment guidelines and believes these revisions are protective of public health, including sensitive subpopulations. These revisions reflect new scientific knowledge and techniques, and in particular, explicitly include consideration of possible differential effects on the health of infants, children and other sensitive subpopulations in accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25). Therefore, incorporation of these revisions to the District's Health Risk Assessment Guidelines for all new and modified sources will equally serve to protect public health, including sensitive subpopulations.*

***Comment 3:* Opposition to different standards for different communities.**
This approach will have unintended negative impacts by delaying economic recovery and hurting job opportunities in areas where investment and job creation are needed most.

Response to Comments 3 through 10 is summarized below.

<u>Comment 4:</u> Economic Tracking Metrics.
It is critically important to work with stakeholders to develop a set of metrics to be used in an on-going basis that would gauge the economic impact of these rules in areas selected as priority communities. A socioeconomic impact analysis could be used as an economic metric. The socioeconomic impacts analyses should consider the positive impact of jobs and investment on community health. A number of recent studies suggest that income and wealth are key factors in public health. Since stationary sources under Regulation 2-5 are a small contributor to cumulative exposure and concentration levels, it seems conceivable that the employment factor could ultimately be more important to individual and community health.

Response to Comments 3 through 10 is summarized below.

<u>Comment 5:</u> Proposed Regulatory Changes Would Erode Local Government Authority in Land Use Planning.
The proposed rule change would reduce local authority in land use planning decisions and would make it more difficult to attract businesses that communities may want. The proposed rule change would also provide an additional constraint on Smart Growth. It is possible that projects not meeting the lower risks limits in the proposed rule change could not be granted permits under the new system or would be subject to additional costs (e.g., application of TBACT), even if the project resulted in net emissions reductions in the community.

Response to Comments 3 through 10 is summarized below.

<u>Comment 6:</u> Identification of "Priority Communities" is good for incentive programs, but not regulatory programs.
Use for regulatory programs penalizes facilities based solely on proximity and not based on their contribution to actual concentration and exposure.

Response to Comments 3 through 10 is summarized below.

<u>Comment 7:</u> Inappropriate selection criteria for identifying priority communities.
Socioeconomic factors can be useful planning tools for District programs regarding outreach and education, grant opportunities, and perhaps even inspection and enforcement resources. However, when it comes to the granting of permits and emission limits for new and modified sources, these should be based on acceptable public health criteria, which should be uniform throughout the District.

Response to Comments 3 through 10 is summarized below.

<u>Comment 8:</u> No data has been presented to show whether or how the proposed Regulation 2, Rule 5 changes would meet the goal of reducing TAC emissions or impacts in priority communities.

Before imposing new TAC standards in stationary sources, the District should identify and evaluate the benefits and cost effectiveness of the proposed changes. Based on results of the analysis, standards should be adopted only if they're demonstrated to have a significant effect on reducing exposure to TACs from stationary sources.

Response to Comments 3 through 10 is summarized below.

<u>Comment 9:</u> Proposed Regulation Change Will Not Provide Effective Reduction in Cumulative Impacts.

Current risk standards are set at *de minimis* risk levels, any reduction in standards would have very little, if any, public health benefit in Priority Communities. The vast majority of the area and people in a Priority Community would realize no benefit at all from the relatively small reduction in emissions from a new project that could result from the proposed rule.

Substantial statewide programs are currently underway at CARB and OEHHA to achieve cumulative exposure reductions and protection of sensitive subpopulations. The proposed amendments to Regulation 2, Rule 5 would not provide any additional progress toward achieving these goals. Shaving small to trivial increments off the estimated risks of future projects would be much less effective in reducing cumulative risks than would mitigating the sources that contribute most substantially to the cumulative risk in the most highly affected communities.

Response to Comments 3 through 10 is summarized below.

<u>Comment 10:</u> Proposed Regulation Change Will Not Provide Additional Protection for Children.

Applying an arbitrary reduction to the risk limits set by OEHHA specifically to protect children and other sensitive receptors would have no corresponding public health benefit. Application of the proposed rule change to facilities within 500 feet of schools would have little to no benefit because children are only in school for roughly half the days of the year for a limited number of years.

Response to Comments 3 through 10 is summarized below.

RESPONSE TO COMMENTS 3 through 10:

The District has considered all the comments summarized above, and has revised the proposed revisions to Regulation 2, Rule 5 to remove different standards for different communities, and instead incorporate OEHHA's recently adopted revised Health Risk Assessment guidelines to all new and modified projects throughout the District. Specifically, in June 2009, OEHHA revised their Technical Support Document (TSD) for Cancer Potency Factors to consider the increased susceptibility of infants and children to carcinogens, as compared to adults. The updated calculation procedure includes the use of age-specific weighting factors in calculating cancer risks from exposures of infants, children and adolescents, to reflect their anticipated special sensitivity to carcinogens. OEHHA recommends weighting cancer risk by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures that occur from 2 years through 15 years of age. These weighting factors apply to all carcinogens. Under this revised proposal, the stringency of the T-BACT and Project Risk cancer risk standard would increase by 70% relative to existing requirements. The District will revise the HRSA Guidelines to include revisions to OEHHA Health Risk Assessment Guidelines in effect as of June 2009.

In accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia 731, Statutes of 1999, Health and Safety Code Sections 39669.5 et seq.), OEHHA is currently revising their health risk assessment guidelines to reflect scientific knowledge and techniques developed since their previous guidelines were prepared (in 2003), and in particular to explicitly include consideration of possible differential effects on the health of infants, children and other sensitive subpopulations. To date, OEHHA has revised the TSD for the Derivation of Noncancer Reference Exposure Levels, and the TSD for Cancer Potency Factors: Methodologies for derivation, listing of available values, and adjustments to allow for early life stage exposures. OEHHA is still working on revising the TSD for Exposure Assessment and the Guidance Manual for Preparation of Health Risk Assessments. When the remaining revisions to the guidelines are finalized and adopted, the District will revise the HRSA Guidelines accordingly.

Comment 11: ***Include a method to track reductions in risk due to source shutdown or emissions reduction projects.***

Response 11: *The revised proposed amendments to Regulation 2, Rule 5 retains the new provision for tracking toxic air contaminant emissions within the Priority Communities. However, the scope of this provision has been broadened to include emissions from stationary, mobile, and area wide sources, and to address both increases and decreases in emissions from sources in these communities.*

Comment 12: ***Proposal does not address the main source of emissions – mobile sources.***
The focus should be on identifying and mitigating the dominant sources of existing and future estimated risks from air toxics, not on identifying and mitigating future *de minimis* risks. The CARE Program has demonstrated that the vast majority of estimated health risks are attributable to mobile sources and that the majority of neighborhoods with the highest estimated health risks are adjacent to transportation corridors. (86% of the toxicity-weighted emissions in the Bay Area are attributed to diesel particulates.) To address this issue, CARB has a program in place to reduce diesel risks associated with Goods Movement by 85%.

Response 12: *Data indicate that stationary source contributions to health impacts in Priority Communities are generally small compared to impacts from mobile sources, nevertheless the District has committed to tracking emission increases and reductions, and evaluating cumulative impacts in each priority community and is planning regulations to mitigate risk from specific source categories (e.g., steel foundries and metal melting).*

Comment 13: Emission reductions achieved within a project or a previous project should be considered for mitigation of toxic emission increases.

Response 13: *With the limited exception of the contemporaneous reduction of a modified source (Section 601.4), the District is not considering emission or risk reduction credits at this time. Emission reductions achieved through replacements or modifications of existing sources provide important contributions to risk reduction. The District may consider adding an emission/risk reduction credit provision at a later date.*

Comment 14: The District is premature in proposing to use Age Sensitivity Factors; recommends that BAAQMD continue to monitor and participate in the efforts brought forward by CARB and OEHHA, but that it not implement the ASFs until the state-wide scientific and regulatory process has been finalized and approved.

Response 14: *District staff believes that it is appropriate to implement the Age Sensitivity Factors at this time. OEHHA adopted the ASFs in June 2009 and has given staff verbal direction regarding implementation (e.g., treat third trimester exposure the same as an infant and use children's breathing rate). If the pending OEHHA exposure guidelines provide a different methodology, the District will update the HRSA guidelines.*

Comment 15: ***Public process for deciding priority communities.***
We recommend you utilize a full public process to make any future changes to areas considered as priority communities. A facility could site in an area not considered a priority community, only to learn down the road that an area is redesignated. This could change the permitting requirements for these facilities with real economic consequences. It is not clear what health benefit would result to the neighboring community.

Response 15: *The District intends to utilize a public process to make any future changes to areas considered as priority communities. Priority Communities are the main focus of the District's Community Air Risk Evaluation (CARE) Program, which implements and supports a variety of health risk mitigation measures in the Bay Area.*

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix F:

CEQA Analysis & Negative Declaration

Initial Study/Negative Declaration for the Amendments to Bay Area Air Quality Management District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants

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CHAPTER 1

INTRODUCTION

PURPOSE OF THIS DOCUMENT

This Negative Declaration assesses the environmental impacts of the proposed adoption of amendments to Regulation 2, Rule 5 (Regulation 2-5) – New Source Review of Toxic Air Contaminants (TACs) by the Bay Area Air Quality Management District (BAAQMD or District). This assessment is required by the California Environmental Quality Act (CEQA) and in compliance with the state CEQA Guidelines (Title 14 California Code of Regulations §15000 et seq.). A Negative Declaration serves as an informational document to be used in the decision-making process for a public agency that intends to carry out a project; it does not recommend approval or denial of the project analyzed in the document. The BAAQMD is the lead agency under CEQA and must consider the impacts of the proposed rule amendments when determining whether to adopt them. The BAAQMD has prepared this Negative Declaration because no significant adverse impacts are expected to result from the proposed rule amendments.

SCOPE OF THIS DOCUMENT

This document evaluates the potential impacts of the proposed amendments on the following resource areas:

- aesthetics,
- agricultural resources,
- air quality,
- biological resources,
- cultural resources,
- geology and soils,
- hazards and hazardous materials,
- hydrology and water quality,
- land use planning,
- mineral resources,

- noise,
- population and housing,
- public services,
- recreation,
- transportation and traffic, and
- utilities and service systems.

IMPACT TERMINOLOGY

The following terminology is used in this Negative Declaration to describe the levels of significance of impacts that would result from the proposed rule amendments:

- An impact is considered beneficial when the analysis concludes that the project would have a positive effect on a particular resource.
- A conclusion of no impact is appropriate when the analysis concludes that there would be no impact on a particular resource from the proposed project.
- An impact is considered less than significant if the analysis concludes that an impact on a particular resource topic would not be significant (i.e., would not exceed certain criteria or guidelines established by BAAQMD). Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource.
- An impact is considered less than significant with mitigation incorporated if the analysis concludes that an impact on a particular resource topic would be significant (i.e., would exceed certain criteria or guidelines established by BAAQMD), but would be reduced to a less than significant level through the implementation of mitigation measures.

ORGANIZATION OF THIS DOCUMENT

The content and format of this document, described below, are designed to meet the requirements of CEQA.

- Chapter 1, “Introduction,” identifies the purpose, scope, and terminology of the document.
- Chapter 2, “Description of the Proposed Rule,” provides background information of Regulation 2-5, describes the proposed rule amendments, and describes the area and facilities that would be affected by the amendments.

- Chapter 3, "Environmental Checklist," presents the checklist responses for each resource topic. This chapter includes a brief setting description for each resource area and identifies the impact of the proposed rule amendments on the resources topics listed in the checklist.

- Chapter 4, "References Cited," identifies all printed references and personal communications cited in this report.

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CHAPTER 2

DESCRIPTION OF THE PROPOSED RULE

BACKGROUND

The Bay Area Air Quality Management District (District or BAAQMD) is proposing amendments to Regulation 2, Rule 5: Air Toxics New Source Review (Regulation 2-5) to increase the stringency of the standards for new and modified stationary sources by adopting updates to Cal/EPA's Office of Environmental Health Hazard Assessment's (OEHHA's) health risk assessment guidelines, particularly new Age Sensitivity Factors that will increase lifetime residential cancer risk estimates by a factor of 1.7. Staff also proposes tracking of toxic emission increases and reductions in Priority Communities in order to assess cumulative risk. The rule and Health Risk Screening Analysis (HRSA) Guidelines would be updated with revised health effects values adopted by OEHHA as of June 1, 2009.

AIR TOXICS NEW SOURCE REVIEW PROGRAM

The Air Toxics New Source Review (NSR) Program was established in 1987 at the direction of the District's Board of Directors, and was initially implemented based on policies and procedures established by the District's Air Pollution Control Officer (APCO). In 2005, the District updated the Air Toxics NSR Program and codified the Air Toxics NSR policies and procedures in Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, in the Manual of Procedures, Volume II, Part 4: New and Modified Sources of Toxic Air Contaminants, and in the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines.

The goal of the Air Toxics NSR Program is to prevent significant increases in health risks resulting from new and modified stationary sources of TACs based on preconstruction permit review. The program is also intended to reduce existing health risks by requiring updated control requirements when older, more highly polluting, sources are modified or replaced. Regulation 2, Rule 5 contains health risk based thresholds at which a new or modified source must employ Best Available Control Technology for Toxics (TBACT) and health risk limits that each project cannot exceed. The rule also delineates the procedures to be used for calculating TAC emission increases and reductions.

When evaluating heath impacts from new and modified sources, the District follows the BAAQMD Health Risk Screening Analysis (HRSA) Guidelines, which generally conform to State Air Toxics Hot Spots Health Risk Assessment (HRA) guidelines. The California Office of Environmental Health Hazard Assessment (OEHHA) periodically revises the State HRA guidelines and has made a number of changes since the BAAQMD

HRSA Guidelines were adopted in 2005. The goals of this rule development project are: (a) to provide an additional margin of public health safety for children and residential receptors, and (b) to increase conformity with the State HRA guidelines.

CARE PROGRAM

In 2004, the District initiated the Community Air Risk Evaluation (CARE) program, which focuses on assessing air pollution health impacts for specific Bay Area Priority Communities and sensitive receptors and reducing health disparities for highly impacted individuals. The CARE program takes a broader look at air pollution health impacts than the District's other toxic programs by including both stationary and mobile sources of air pollution in the health impacts analysis and by evaluating the cumulative health impacts that arise from multiple causes of air pollution in a community.

Through the CARE program, the District has determined that diesel PM is the primary contributor to Bay Area air pollution health impacts, and the CARE Workgroup has identified six "Priority Communities" in the Bay Area that have comparatively high health impacts, sensitive populations, and other deleterious factors. The District is pursuing multiple mitigation measures (e.g. grants, incentives, land use guidance, and regulations) to reduce health impacts related to air pollution in these Priority Communities.

Data indicate that stationary source contributions to health impacts in Priority Communities are generally small compared to impacts from mobile sources, nevertheless the District has committed to tracking emission increases and reductions, and evaluating cumulative impacts in each priority community and is planning regulations to mitigate risk from specific stationary source categories (e.g., steel foundries and metal melting).

HEALTH RISK ASSESSMENTS

As required by Regulation 2, Rule 5, HRSAs for new and modified sources are conducted in accordance with the procedures identified in the BAAQMD HRSA Guidelines (adopted in 2005). The BAAQMD HRSA Guidelines generally conform to OEHHA's health risk assessment guidelines for the Air Toxics Hot Spots program. Since 2005, OEHHA has made a number of revisions to these guidelines and is considering additional revisions that are expected to be adopted in 2010.

BAAQMD staff has been working closely with OEHHA to understand the effects that these adopted and pending revisions to health risk assessment methodologies may have on Regulation 2-5. These changes reflect new scientific knowledge and techniques, and in particular, explicitly include consideration of possible differential effects on the health of infants, children and other sensitive subpopulations in accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia). In particular, OEHHA adopted Age Sensitivity Factors (ASFs) on June 1, 2009 to account for inherent increased susceptibility to carcinogens during infancy and childhood. ASFs are used to estimate cancer risk as follows: (1) a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and (2) a factor of 3 for exposures

that occur from 2 years through 15 years of age. These factors increase lifetime residential cancer risk estimates by 70 percent. OEHHA also adopted revisions to health effects values for a number of TACs.

OEHHA is considering additional revisions to the Exposure Assessment and Stochastic Analysis Technical Support Document. OEHHA has indicated that these changes in exposure assessment methodology, when combined with ASFs, may increase estimates of cancer risk by a factor of 2 to 3 relative to existing procedures. BAAQMD expects that the revised exposure assessment methodology will be health protective and plans to incorporate these revisions into the District HRSA guidelines after adoption by OEHHA.

OBJECTIVES

BAAQMD is proposing amendments to Regulation 2-5 to increase conformity with State health risk assessment guidelines and to add a tracking provision for emission increases and reductions of toxic air contaminants in order to assess cumulative impacts in Priority Communities. Specifically, the District is proposing to implement OEHHA's Age Sensitivity Factors and to incorporate any health effects value revisions that OEHHA has adopted as of June 1, 2009. The proposed amendments will result in an increase in stringency of Toxic-Best Available Control Technology (T-BACT) and Project Risk cancer risk standards by a factor of 1.7 for residential receptors relative to existing requirements. These changes are expected to provide an additional margin of public health and safety for children and residential receptors.

PROPOSED AMENDMENTS

The District is proposing to amend Regulation 2-5: New Source Review of Toxic Air Contaminants. The adoption of the proposed revisions to Regulation 2, Rule 5 will update and enhance program requirements and increase conformity with state risk assessment guidelines. The rule is organized into six sections as follows: General (section numbers in the 100's), Definitions (200's), Standards (300's), Administrative Requirements (400's), Monitoring and Records (500's), and Manual of Procedures (600's). Regulation 2-5 also includes Toxic Air Contaminant Trigger Levels.

AMENDMENTS TO GENERAL REQUIREMENTS

The general requirements define the applicability of the rule and identify any exemptions from the rule or from specific sections of the rule. The BAAQMD is proposing amendments to Section 2-5-111: Exemption, Emergency Standby Engines. The District is proposing to exempt emissions occurring during initial start-up testing of emergency standby engines. Start-up testing may be necessary to demonstrate compliance with emission standards, efficacy of abatement systems, or adequate performance. These emissions are not routine or entirely predictable. Operation of these engines is also limited by provisions of the State Airborne Toxics Control Measures (ATCM).

DEFINITION AMENDMENTS

The BAAQMD is proposing to modify four existing definitions and to add three new definitions to Regulation 2-5. These definitions are considered necessary to explain the District's new terms and clarify risk assessment procedures.

Modified Definitions:

Section 2-5-206: *Cancer Risk*: Addition of a phrase to definition to indicate consideration of Age Sensitivity Factors, where appropriate, to account for inherent increased susceptibility to carcinogens during infancy and childhood.

Section 2-5-212: *Maximally Exposed Individual (MEI)*: Addition of a sentence to clarify that MEI locations are determined for each type of health impact (cancer risk, chronic hazard index, and acute hazard index) and for all potential receptors (residential, worker, and student). The highest health impact for any type of receptor is the MEI for that particular health impact. The MEI location for cancer risk may be different than the MEI location for chronic hazard index or the MEI location for acute hazard index.

Section 2-5-216: *Project*: Clarification that a project involving a modified source may include any contemporaneous risk reduction that occurs at that modified source as a result of the project.

Section 2-5-218: *Receptor Location*: Addition of reference to student receptor.

New Definitions:

Section 2-5-225: *K-12 School*: The proposed definition for a K-12 school is based on the California Health and Safety Code Section 42301.9(a) definition of "school," and consistent with the definition of a school in Diesel ATCMs. BAAQMD proposes to use this school definition because the BAAQMD has procedures in place to identify these schools and is currently using this definition for the purpose of satisfying the public noticing requirements for schools (Regulation 2-1-412).

Section 2-5-226: *Student Receptor*: This section defines the term: "student receptor" and is necessary to clearly identify the applicability of risk limits.

Section 2-5-227: *Priority Community*: This definition describes the general concept of a priority community, which was developed through the BAAQMD's CARE Program.

ADMINISTRATIVE REQUIREMENT AMENDMENTS

The BAAQMD is proposing to add Section 2-5-404: Designation of Priority Communities, which is a requirement for the Air Pollution Control Officer to publish and update a list of the designated Priority Communities. The designation procedures and selection criteria were initially developed through the District's CARE program and are documented and will be periodically updated in the District's Guidelines for Designation of Priority Communities. The BAAQMD is also proposing the addition of Section 2-5-405: Cumulative Impact Summary for Priority Communities, which will require the APCO to publish and update a cumulative impact summary report. For each priority

community, the BAAQMD will track all toxic emission increases and reductions occurring after January 1, 2010 and will periodically evaluate the cumulative impact for each priority community.

MANUAL OF PROCEDURES

The District is proposing revisions to Section 2-5-601: Emission Calculation Procedures to clarify existing procedures for modified sources. The District is proposing to add Section 2-5-604: Calculation Procedures for Toxicity Weighted Emissions to explain the toxicity weighted emission calculation procedures, which will be used for tracking health impact changes in Priority Communities.

AMENDMENTS TO TABLE 2-5-1 – HEALTH EFFECTS VALUES

The proposed TAC trigger levels shown in Table 2-1 (revised Regulation 2-5, Table 2-5-1) are used to determine the need for a site-specific health risk screening analysis (HRSA) for projects involving new and modified sources. The proposed TAC trigger levels are also used: (1) to establish permit requirements for certain sources that may otherwise qualify for permit exemptions, (2) as part of the applicability of the accelerated permit program, and (3) in determining permit fees. The proposed TAC trigger levels are considered to be reasonable de minimus emission rates for use at a project-level. Projects with emissions below the TAC trigger levels are unlikely to cause, or contribute significantly to, adverse health risks.

The proposed TAC trigger levels were calculated using: (1) target health risk levels that are considered de minimus for project-level risks, (2) OEHHA/ARB health effect values, (3) generally conservative modeling procedures which establish the extent to which a TAC is transported and dispersed in the atmosphere after its release from the source, and (4) health-protective assumptions regarding the extent of an individual's exposure to an emitted TAC, including the new Age Sensitivity Factors.

Target Health Risk Levels: For chronic health risk, a lifetime cancer risk of 1.0 in a million (1.0×10^{-6}) and a non-cancer hazard index of 0.2 are used as the target health risk levels to derive the chronic trigger levels; these are the risk thresholds at which TBACT is required (Section 2-1-301). For acute health risk, a hazard index of 1.0 is used as the target health risk level, which is the same as the acute non-cancer hazard index limit (Section 2-1-302.3).

Health Effects Values: The proposed changes to Table 2-5-1 (shown in Table 2-1) incorporate the most recent health effects values adopted by OEHHA/ARB (through June 2009) for use in the ATHS Program. Revisions in health effects values (other than 8-hour RELs) adopted between January 1, 2005 and June 1, 2009 are reflected in the proposed Table 2-5-1. OEHHA has adopted 8-hour RELs for a few compounds; however, the District is not proposing to add these 8-hour RELs to Table 2-5-1at this time, because the risk assessment guidance procedures that would use these 8-hour RELs

are not complete. Table 2-1 identifies the new and revised health effects values that are being incorporated into revised Table 2-5-1 (shown as Table 2-1).

TABLE 2-1

REVISED HEALTH EFFECTS VALUES
REVISED TABLE 2-5-1

Chemical	Acute Inhalation REL (µg/m^3)	Chronic Inhalation REL (µg/m^3)	Chronic Oral REL (mg/kg-day)	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$
Acetaldehyde	4.7E+02	***1.4E+02*** ~~***9.0E+00***~~		1.0E-02
Acrolein	***2.5E+00*** ~~***1.9E-01***~~	***3.5E-01*** ~~***6.0E-02***~~		
Arsenic and compounds (inorganic)	***2.0E-01*** ~~***1.9E-01***~~	***1.5E-02*** ~~***3.0E-02***~~	***3.5E-06*** ~~***3.0E-04***~~	1.2E+01
Arsine	***2.0E-01*** ~~***1.6E+-2***~~	***1.5E-02*** ~~***5.0E-02***~~		
Ethylbenzene		2.0E+03		***8.7E-03***
Formaldehyde	***5.5E+01*** ~~***9.4E+01***~~	***9.0E+00*** ~~***3.0E+00***~~		2.1E-02
Manganese		***9.0E-02*** ~~***2.0E-01***~~		
Mercury and compounds (inorganic)	***6.0E-01*** ~~***1.8E+00***~~	***3.0E-02*** ~~***9.0E-02***~~	***1.6E-04*** ~~***3.0E-04***~~	
Mercuric chloride	***6.0E-01*** ~~***1.8E+00***~~	***3.0E-02*** ~~***9.0E-02***~~	***1.6E-04*** ~~***3.0E-04***~~	
Silica (crystalline, respirable)		***3.0E+00***		
Sulfur trioxide	1.2E+02	***1.0E+00***		

Note: Values in *italics* have been added or revised.

OEHHA has developed and adopted new risk assessment guidelines that update and replace CAPCOA's Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993. OEHHA has deleted old CAPCOA chronic RELs and USEPA RfCs for many chemicals. The BAAQMD is revising Table 2-5-1 to incorporate these chronic REL deletions. Table 2-2 identifies chemicals for which the chronic REL is being deleted, but the chemical will remain in revised Table 2-5-1 because it has other established health effects values. Table 2-3 identifies the chemicals that will be removed from revised Table 2-5-1 because their chronic RELs are being deleted and these chemicals have no other established health effects values.

Weighting Factors: For purposes of calculating toxicity weighted emissions for mitigated project risk, chronic reference exposure level (CREL) and cancer potency (CP) weighting factors were added to the revised Table 2-5-1 (shown as Table 2-1). These factors were developed assuming multi-pathway exposure where applicable, and continuously operating sources for residential receptor exposure.

TABLE 2-2

CHEMICALS FOR WHICH THE CHRONIC REL WAS DELETED IN TABLE 2-5-1

Acrylamide
Acrylic acid
Allyl chloride
Aniline
Benzidine (and its salts)
benzidine based dyes
direct black 38
direct blue 6
direct brown (technical grade)
Benzyl chloride
Copper and compounds
Dibromo-3-chloropropane, 1,2-(DBCP)
Di(2-ethylhexyl)phthalate (DEHP)
Ethylene glycol butyl ether – EGBE (2-butoxy ethanol; butyl cellosolve)
Hexachlorobenzene
Hexachlorocyclohexanes (mixed or technical grade)
Hexachlorocyclohexane, alpha-
Hexachlorocyclohexane, beta-
Hexachlorocyclohexane, gamma- (lindane)
Methyl ethyl ketone (MEK) (2-butanone)
Ozone
Pentachlorophenol
PCBs (polychlorinated biphenyls)
Sodium Hydroxide
Sulfates
Vinyl chloride

TABLE 2-3

CHEMICALS REMOVED FROM TABLE 2-5-1

Antimony compounds	Freons
Antimony trioxide	Hexachlorocyclopentadiene
Bromine and compounds	Methyl mercury
bromine pentafluoride	Methyl methacrylate
hydrogen bromide	Mineral fibers (<1% free silica)
2-Chloroacetophenone	ceramic fibers (man- made)
Chlorodifluoromethane (Freon 22)	glasswool (man- made fibers)
Chlorofluorocarbons	mineral fibers (fine: man- made)
2-Chlorophenol	rockwool (man- made fibers)
Chloroprene	slagwool (man -made fibers)
Ethyl acrylate	Nitrobenzene
Fluorocarbons (chlorinated)	2-Nitropropane
chlorinated fluorocarbon (CFC-113)	Phosphorus (white)
chlorodifluoromethane (Freon 22)	Tetrachlorophenols
dichlorofluoromethane (Freon 21)	Vinyl bromide
trichlorofluoromethane (Freon 11)	Zinc and compounds
fluorocarbons (brominated)	zinc oxide

ADDITIONAL AMENDMENTS

To clarify the scope and to enhance the enforceability of the Regulation 2, Rule 5, The BAAQMD is also proposing a number of other changes in the form of modifications and additional amendments, including revisions to the Manual of Procedures relating to the rule amendments.

AFFECTED FACILIIES

The proposed rule amendments will incorporate OEHHA age sensitivity factors (ASFs) into the residential cancer risk calculation procedures. Using these ASFs will result in a 70 percent increase in the cancer risk for residential receptors compared to current risk calculation procedures. Use of ASFs and OEHHA's revised health effects values for numerous TACs will also be incorporated into the District's procedures for establishing the risk screen trigger levels listed in Table 2-5-1. On average, the annual risk screen trigger levels for carcinogenic TACs are about 58% of the previous risk screen trigger levels. For non-carcinogenic TACs, the health affects value changes are variable. Some non-carcinogenic TACs will have risk screen trigger level increases, some non-carcinogenic TACs will have trigger level decreases, and some non-carcinogenic compounds will be removed from Table 2-5-1, depending on the specific health affect value change that OEHHA adopted for that compound.

The proposed amendments are expected to require more projects to undergo site-specific risk screening analyses due to the proposed lower risk screen thresholds for carcinogens. In addition, more projects that emit carcinogens will require TBACT, emission reductions, and other risk reduction measures due to the 70% increase in residential cancer risk.

For mercury, the acute and chronic reference exposure levels (RELs) are approximately one third of the previous values. These mercury REL changes may result in substantially higher acute and chronic hazard index levels for projects involving sources with mercury emissions. Crematories, in particular, are likely to be impacted by this change. The District does not expect any substantial impacts due to the REL and trigger level changes that are proposed for other non-carcinogenic compounds, because either the non-carcinogenic health impacts resulting from the revised RELs are not expected to be substantial in comparison to the carcinogenic health impacts from the same sources or few sources are affected by the proposed REL change.

In order to determine potential impacts to future projects based on the proposed rule amendments, the District has also reviewed recent risk assessment data. In 2008, the BAAQMD conducted 399 HRSAs on new or modified sources. The projects evaluated included new or modified diesel engines (78 percent), gasoline dispensing facilities (4 percent), and a variety of other commercial and industrial sources, such as gas fired combustion devices, crematories, petroleum refinery projects, cement plants and landfills. Potential impacts to the three most common source categories: diesel-fired emergency generator engines, gasoline dispensing facilities (GDFs), and crematories; are discussed in more detail below.

Diesel-Fired Emergency Generator Engines

The District reviewed 50 HRSAs that were conducted in 2009 for new diesel-fired emergency standby engines. Based on this review and considering the proposed rule amendments, the District estimates that an additional 10 percent of new and modified emergency standby diesel engine projects will require the use of cleaner diesel engines or diesel PM controls. An additional 12 percent of these diesel engine projects are expected to achieve compliance with Regulation 2-5 by accepting lower annual operating rate limits than would be required without these proposed amendments. The remainder of the diesel engine projects would be expected to comply using cleaner diesel engines (i.e., Tier 3 or Tier 4 CARB and EPA engines) or diesel particulate filters. By 2011, all diesel engines larger than 175 bhp will be subject to CARB's interim Tier 4 diesel particulate matter standards that are lower than the current TBACT/ATCM limit of 0.15 g/bhp-hr. By 2011, only 8 percent of the projects in compliance with CARB's diesel particulate matter standards, will require emission controls, and only 4 percent of the projects will require cleaner engines or diesel PM filters to achieve compliance with Regulation 2-5. By 2013, all projects in compliance with CARB's diesel particulate matter standards, are expected to comply with the Regulation 2-5's project risk limits without any additional diesel PM reductions.

Gasoline Dispensing Facilities

The District evaluated 100 HRSAs for gasoline dispensing facilities (GDFs) that were conducted during 2004-2009. Most of the GDF projects that will be subject to Regulation 2-5 in the future are expected to involve new retail facilities. Most retail gasoline dispensing facilities are now required to have enhanced vapor recovery (EVR). These EVR upgrades are expected to reduce cancer risk weighted emissions by about 50 percent compared to current Phase II balance systems. For new gasoline dispensing facilities equipped with EVR upgrades, maximum allowable throughput limits will be 41 percent lower than the throughput limits allowed under the current regulation. However, the maximum allowable throughput limit for a new EVR station subject to the proposed Regulation 2-5 amendments will be 17 percent higher than the throughput limit that would have been allowed for comparable new station equipped with the older Phase II balance system. Thus, the recent EVR requirements for retail GDF will mitigate the impacts of the proposed Regulation 2-5 amendments.

Crematories

The District reviewed 19 HRSAs for crematories in the Bay Area. The cancer risks for these projects ranged from 0.6 in a million to 10.0 in a million for most sites. One site had a cancer risk of 90 in a million. For 18 new and modified crematory projects that the District review during the last five years, 7 crematory projects (39%) would require additional emission or risk reduction measures under the proposed new residential cancer risk calculation procedures. Most of these projects would likely be able to comply with minor project refinements, but 2 or 3 of these crematory projects would require substantial add-on controls.

Remaining Affected Facilities

A variety of other commercial and industrial sources, such as gas fired combustion devices, petroleum refinery projects, cement plants and landfills may have minor impacts due to the proposed rule changes. Additional more detailed and refined HRSAs will be required to determine what action may be required under Regulation 2-5. Any facility required to reduce health impacts from a project would have the option of refining emission calculation and/or health risk assessment procedures, reducing the scale of the project, limiting project emissions, installing abatement equipment, relocating proposed sources, making stack height changes, or altering other project variables that could reduce the health impacts resulting from the project.

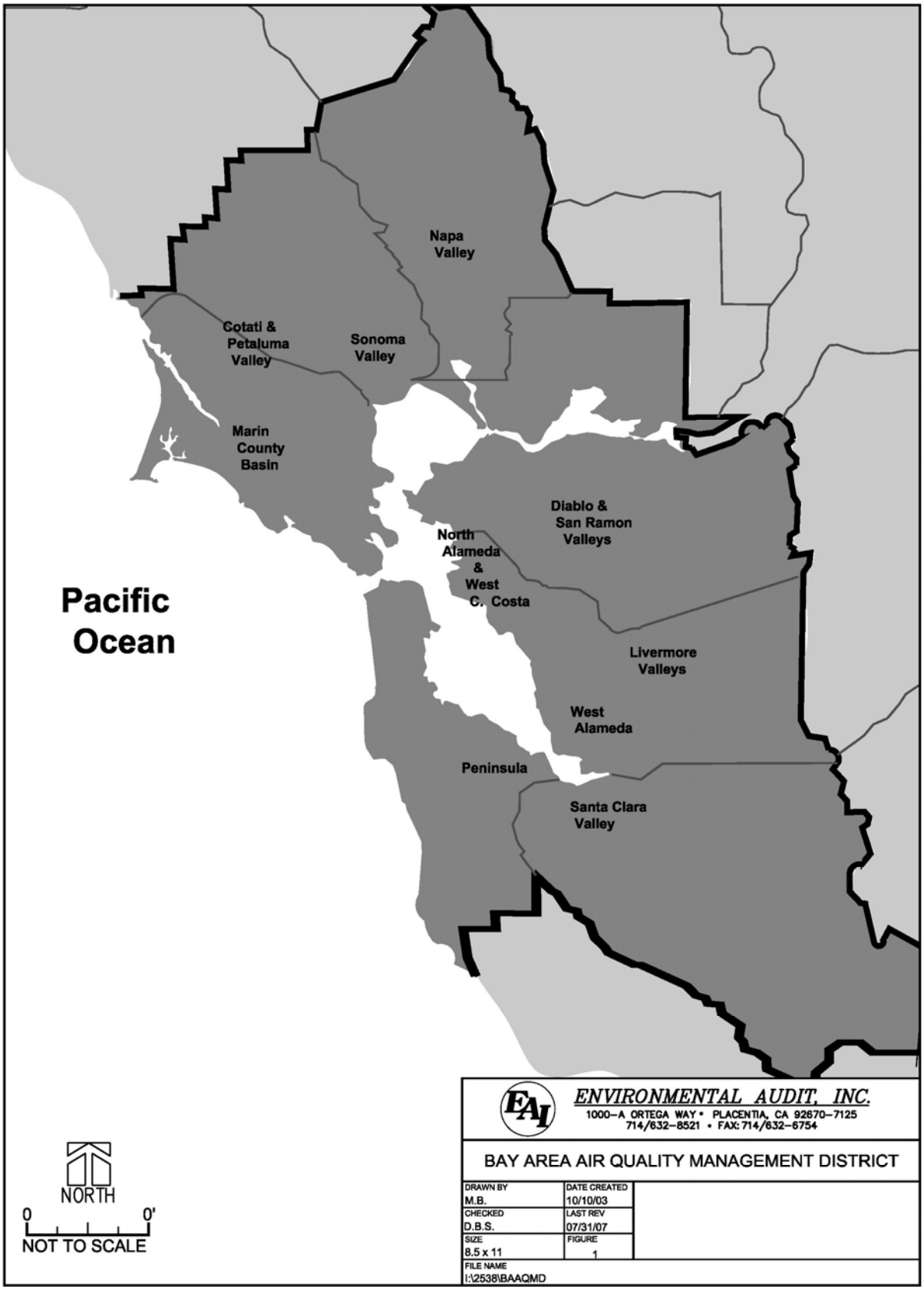
The direct air quality impact from these proposed rule amendments is a reduction in toxic risk associated with new and modified sources, thus providing an air quality benefit and avoiding potential future impacts. Any potential adverse environmental impacts from changing cancer risk calculation procedures or non-cancer health effects values would typically be secondary or cross-media impacts generated by the installation and operation of air pollution control equipment. However, because of the source types (gasoline dispensing facilities and IC engines), risk reduction would most likely involve product or equipment replacement or a process change (e.g., reduce usage or alter facility practices).

Very few additional projects are expected to require abatement equipment with cross-media impacts and these impacts are not expected to be significant.

AFFECTED AREA

The proposed rule amendments would apply to facilities and operations under BAAQMD jurisdiction. The BAAQMD jurisdiction includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma counties (approximately 5,600 square miles). The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys, and bays.

The facilities affected by the proposed rule amendments are located within the jurisdiction of the BAAQMD (see Figure 1).


Napa Valley
Cotati & Petaluma Valley
Sonoma Valley
Marin County Basin
Diablo & San Ramon Valleys
North Alameda & West C. Costa
Pacific Ocean
Livermore Valleys
West Alameda
Peninsula
Santa Clara Valley
NORTH
0 0'
NOT TO SCALE
ENVIRONMENTAL AUDIT, INC.
1000-A ORTEGA WAY • PLACENTIA, CA 92670-7125
714/632-8521 • FAX: 714/632-6754
BAY AREA AIR QUALITY MANAGEMENT DISTRICT
DRAWN BY M.B.
DATE CREATED 10/10/03
CHECKED D.B.S.
LAST REV 07/31/07
SIZE 8.5 x 11
FIGURE 1
FILE NAME I:\2538\BAAQMD

CHAPTER 3

ENVIRONMENTAL CHECKLIST

ENVIRONMENTAL CHECKLIST FORM

1. Project Title:	Bay Area Air Quality Management District (BAAQMD) Proposed Amendments to Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminant
2. Lead Agency Name and Address:	Bay Area Air Quality Management District 939 Ellis Street San Francisco, California 94109
3. Contact Person and Phone Number:	Scott Lutz, Engineering Manager 749-4676 or slutz@baaqmd.gov
4. Project Location:	This rule amendment applies to the area within the jurisdiction of the Bay Area Air Quality Management District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
5. Project Sponsor's Name and Address:	Bay Area Air Quality Management District 939 Ellis Street San Francisco, California 94109
6. General Plan Designation:	Not applicable.
7. Zoning	Not applicable.
8. Description of Project	See "Background" in Chapter 2.
9. Surrounding Land Uses and Setting	See "Affected Area" in Chapter 2.
10. Other Public Agencies Whose Approval Is Required	None

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would potentially be affected by this Project (i.e., the project would involve one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

DETERMINATION

On the basis of this initial evaluation:

☑ I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Signature Date

_____ _____

Printed Name For

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
I.	**AESTHETICS.**				
	Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☐	☑
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☑
d)	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

The proposed rule amendments are aimed to increase the stringency of the standards for new and modified stationary sources of TACs in the BAAQMD. These types of sources include new or modified diesel engines, gasoline dispensing facilities, and a variety of other commercial and industrial sources, such as gas fired combustion devices, crematories, petroleum refinery projects, cement plants, and landfills. These types of facilities and equipment are most often found in commercial or industrial areas. Scenic highways or corridors may be, but are not commonly located, near commercial or industrial areas.

Regulatory Background

Visual resources are generally protected by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

I a-c. The proposed rule amendments are not expected to trigger major construction activities or substantial physical changes to existing facilities potentially affected by the proposed project. The proposed rule amendments may require the installation of or replacement of equipment at new or existing facilities due to the more stringent TBACT requirements, result in coating or product reformulation, or result in process changes. The construction and installation of additional equipment would occur within the confines of existing or new industrial/commercial developments. The construction associated with the installation of such units is expected to be minor and would be installed at the time other equipment (the proposed new source, e.g., tank, gas dispensing facility, etc.) would be installed. Air pollution control equipment generally would be fabricated off-site at the manufacturing facility, delivered to the site, and installed. Therefore, substantial construction equipment, construction workers, and construction materials will not be needed and stockpiling of construction materials will not result from the proposed project. Equipment replacement could result in minor construction activities, which would be temporary, and expected to be equivalent replacement of existing equipment with newer equipment that may improve aesthetics. No scenic resources will be damaged and since no major new construction activities associated with new buildings or other structures is anticipated, scenic resources will not be obstructed and the existing visual character of any site in the vicinity of affected facilities will not be degraded. On the contrary, scenic vistas and visual character of the site may improve as old equipment is replaced as a result of implementing the proposed project.

I d. There are no components in the amendments to Regulation 2-5 that would require construction activities at night. Therefore, no additional lighting at facilities would be required. Similarly, the proposed project has no provisions that would require affected equipment to operate at night. Thus, the proposed project is not expected to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, the proposed project is not expected to create significant adverse aesthetic impacts.

Based on the above consideration, significant adverse impacts to aesthetics are not expected from the proposed amendments to Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE RESOURCES.				
In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☑
c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Some of these agricultural lands are under Williamson Act contracts.

The industrial and commercial operations affected by the proposed rule amendments are primarily located in commercial or industrial areas of the BAAQMD.

Regulatory Background

Agricultural resources are generally protected by the City and/or County General Plans, Community Plans through land use and zoning requirements, as well as any applicable specific plans, ordinances, local coastal plans, and redevelopment plans.

Discussion of Impacts

II a-c. As discussed previously under "Aesthetics," no major construction activities associated with modification of existing structures nor construction of new structures is anticipated to result from adopting and implementing the proposed project. The rule amendments are not expected to result in any construction of new buildings or other structures that would require converting farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract. Minor construction activities within the confines of existing or new facilities would be expected. Since the proposed project would not substantially change the facilities from which TACs are emitted, there are no provisions in the proposed rule that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agricultural resources will be altered by the proposed project.

Based on the above consideration, significant adverse impacts to agriculture resources are not expected from the proposed rule amendments and impact assessment for facilities subject to Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY:				
When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☐	☐	☑
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☑
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☑
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑
f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☐	☑

Setting

Meteorological Conditions

The summer climate of the West Coast is dominated by a semi-permanent high centered over the northeastern Pacific Ocean. Because this high pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus the conditions that persist along the coast of California during summer are a northwest air flow and negligible precipitation. A thermal low pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

In winter, the Pacific High weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. During the winter rainy periods, inversions are

weak or nonexistent, winds are often moderate and air pollution potential is very low. During winter periods when the Pacific high becomes dominant, inversions become strong and often are surface based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog.

Topography

The San Francisco Bay Area is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays. Elevations of 1,500 feet are common in the higher terrain of this area. Normal wind flow over the area becomes distorted in the lower elevations, especially when the wind velocity is not strong. This distortion is reduced when stronger winds and unstable air masses move over the areas. The distortion is greatest when low level inversions are present with the surface air, beneath the inversion, flowing independently of the air above the inversion.

Winds

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate produces a jet that sweeps eastward but widens downstream producing southwest winds at Berkeley and northwest winds at San Jose; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Carquinez Strait, the Golden Gate, or San Bruno Gap.

In winter, the Bay Area experiences periods of storminess and moderate-to-strong winds and periods of stagnation with very light winds. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon, and otherwise light and variable winds.

Temperature

In summer, the distribution of temperature near the surface over the Bay Area is determined in large part by the effect of the differential heating between land and water surfaces. This process produces a large-scale gradient between the coast and the Central Valley as well as small-scale local gradients along the shorelines of the ocean and bays. The winter mean temperature high and lows reverse the summer relationship; daytime variations are small while mean minimum nighttime temperatures show large differences and strong gradients. The moderating effect of the ocean influences warmer minimums along the coast and penetrating the Bay. The coldest temperatures are in the sheltered valleys, implying strong radiation inversions and very limited vertical diffusion.

Inversions

A primary factor in air quality is the mixing depth, i.e., the vertical dimension available for dilution of contaminant sources near the ground. Over the Bay Area, the frequent occurrence of temperature inversions limits this mixing depth and consequently limits the availability of air for dilution. A temperature inversion may be described as a layer or layers of warmer air over cooler air.

Precipitation

The San Francisco Bay Area climate is characterized by moderately wet winters and dry summers. Winter rains (December through March) account for about 75 percent of the average annual rainfall; about 90 percent of the annual total rainfall is received in November to April period; and between June and September, normal rainfall is typically less than 0.10 inches. Annual precipitation amounts show greater differences in short distances. Annual totals exceed 40 inches in the mountains and are less than 15 inches in the sheltered valleys.

Pollution Potential

The Bay Area is subject to a combination of physiographic and climatic factors which result in a low potential for pollutant buildups near the coast and a high potential in sheltered inland valleys. In summer, areas with high average maximum temperatures tend to be sheltered inland valleys with abundant sunshine and light winds. Areas with low average maximum temperatures are exposed to the prevailing ocean breeze and experience frequent fog or stratus. Locations with warm summer days have a higher pollution potential than the cooler locations along the coast and bays.

In winter, pollution potential is related to the nighttime minimum temperature. Low minimum temperatures are associated with strong radiation inversions in inland valleys that are protected from the moderating influences of the ocean and bays. Conversely, coastal locations experience higher average nighttime temperatures, weaker inversions, stronger breezes and, consequently, less air pollution potential.

Air Quality

Criteria Pollutants: It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), sulfur dioxide (SO_2), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The state and national ambient air quality standards for each of these pollutants and their associated health effects are summarized in Table 3-1. The BAAQMD monitors levels of various criteria pollutants at 25 monitoring stations. The 2008 air quality data from the BAAQMD's monitoring stations are presented in Table 3-2.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically (see Table 3-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NOx), and sulfur oxides (SOx). The Air District is unclassified for the federal 24-hour PM10 standard. Unclassified means that the monitoring data were incomplete and at the time of designations did not support a designation of attainment or non-attainment. However, the Air District does not comply with the State 24-hour PM10 standard.

The 2008 air quality data from the BAAQMD monitoring stations are presented in Table 3-2. All monitoring stations were below the State standard and federal ambient air quality standards for CO, NO_2, and SO_2. The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standards. The State 8-hour standard was exceeded on 20 days in 2008 in the Air District, most frequently in the Eastern District (Bethel Island, Livermore, Concord, and Benecia) (see Table 3-2). The federal 8-hour standard was exceeded on 12 days in 2008.

All monitoring stations were in compliance with the federal PM10 standards. The California PM10 standards were exceeded on five days in 2008, most frequently in the Eastern District (Bethel Island). The area under the jurisdiction of the BAAQMD exceeded the federal PM2.5 standard on 12 days in 2008, most frequently in Vallejo and San Jose (see Table 3-2).

TABLE 3-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.075 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 $\mu g/m^3$, annarithmetic mean > 50 $\mu g/m^3$, 24-hr average>	50 $\mu g/m^3$, annual arithmetic mean > 150 $\mu g/m^3$, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 $\mu g/m^3$, annual arithmetic mean>	15 $\mu g/m^3$, annual arithmetic mean> 35 $\mu g/m^3$, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 $\mu g/m^3$, 30-day avg. >=	1.5 $\mu g/m^3$, calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

TABLE 3-2
Bay Area Air Pollution Summary 2008

MONITORING STATIONS	Ozone						CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM10				PM2.5				
	Max 1-Hr	Cal 1-Hr Days	Max 8-Hr	Nat. 8-Hr Days	Cal Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat/Cal Days	Max 24-Hr	Ann Avg	Nat/Cal Days	Ann Avg	Max 24-Hr	Nat Day	Cal Days	Max 24-Hr	Nat Days	3-Yr Avg	Ann Avg	3-Yr Avg
NORTH COUNTIES	(ppb)		(ppb)				(ppm)			(ppb)			(ppb)			($\mu g/m^3$)				($\mu g/m^3$)			($\mu g/m^3$)	
Napa	107	1	77	2	2	61	3.2	1.8	0	64	10	0	--	--	--	21.6	50	0	0	--	--	--	--	--
San Rafael	85	0	69	0	0	50	1.8	1.1	0	56	13	0	--	--	--	18.6	41	0	0	--	--	--	--	--
Santa Rosa*	76	0	64	0	0	51	3.5	1.5	0	49	11	0	--	--	--	*	*	*	*	30.8	0	30.4	8.6	8.4
Vallejo*	109	1	75	0	3	60	2.7	2.3	0	67	10	0	4	1.2	0	*	*	*	*	50.0	7	36.4	9.9	9.8
COAST & CENTRAL BAY																								
Berkley*	53	0	49	0	0	*	2.8	1.7	0	55	14	0	4	13	0	22.5	44	0	0	--	--	--	--	--
Oakland*	86	0	64	0	0	*	3.0	1.6	0	70	15	0	--	--	--	--	--	--	--	30.1	0	*	9.5	*
Richmond	--	--	--	--	--	--	--	--	--	--	--	--	8	1.5	0	--	--	--	--	--	--	--	--	--
San Francisco	82	0	66	0	0	46	5.7	2.3	0	62	16	0	5	1.5	0	22.0	41	0	0	29.4	0	26.3	9.8	9.4
San Pablo	84	0	63	0	0	50	2.5	1.3	0	67	12	0	4	1.4	0	20.9	44	0	0	--	--	--	--	--
EASTERN DISTRICT																								
Benecia*	123	2	86	3	7	*	1.0	0.8	0	38	7	0	5	1.6	0	18.1	52	0	1	--	--	--	--	--
Bethel Island	109	4	90	4	10	76	1.5	1.1	0	41	7	0	4	1.4	0	24.1	77	0	3	--	--	--	--	--
Concord	119	3	88	6	8	78	1.6	1.1	0	50	10	0	4	1.2	0	17.5	51	0	1	60.3	3	34.6	9.3	9.0
Crockett	--	--	--	--	--	--	--	--	--	--	--	--	13	2.1	0	--	--	--	--	--	--	--	--	--
Fairfield	116	2	90	1	2	68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Livermore*	141	5	110	6	8	81	2.4	1.4	0	58	13	0	--	--	--	*	*	*	*	38.6	2	36.2	10.1	9.6
Martinez	--	--	--	--	--	--	--	--	--	--	--	--	6	1.7	0	--	--	--	--	--	--	--	--	--
Pittsburg*	106	1	83	1	2	71	2.8	1.4	0	56	10	0	6	1.8	0	*	*	*	*	--	--	--	--	--
SOUTH CENTRAL BAY																								
Fremont*	112	1	78	1	3	61	1.9	1.4	0	62	14	0	--	--	--	*	*	*	*	28.6	0	28.8	9.4	9.5
Hayward	114	1	86	1	3	63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood City*	82	0	69	0	0	53	4.3	1.9	0	69	14	0	--	--	--	*	*	*	*	27.9	0	29.3	9.1	9.0
San Leandro	96	1	68	0	0	55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SANTA CLARA VALLEY																								
Gilroy*	103	1	79	1	4	73	--	--	--	--	--	--	--	--	--	--	--	--	--	25.5	0	*	--	--
Los Gatos	122	2	97	2	6	72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
San Jose Central	118	1	80	2	3	65	3.3	2.5	0	80	17	0	--	--	--	23.4	57	0	1	41.9	5	35.8	11.5	11.0
San Martin	123	2	77	2	5	76	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sunnyvale	93	0	76	1	2	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Bay Area Days over Standard		**9**		**12**	**20**				**0**			**0**			**0**			**0**	**5**		**12**			

*Station Information: $PM_{2.5}$ monitoring at Gilroy began Mar. 1, 2007, three-year average statistics not available. Benicia and Berkeley sites opened in 2007, Apr. 1 and Dec. 13 respectively; no three-year ozone statistics available. Oakland site opened Nov. 1, 2007, no three-year ozone or $PM_{2.5}$ statistics available. PM_{10} monitoring was discontinued on June 30, 2008 at Freemont, Livermore, Pittsburg, Redwood City, Santa Rosa, and Vallejo, statistics no longer available. SO_2 monitoring was discontinued at San Francisco Dec. 31, 2008

(ppb) = parts per billion (ppm) = parts per million, ($\mu g/m^3$) = micrograms per cubic meter

TABLE 3-3

Ten-Year Bay Area Air Quality Summary
(days over standard)

Year	Ozone			Carbon Monoxide				Nitrogen Dioxide	Sulfur Dioxide		PM10		PM2.5
	8-Hr	1-Hr	8-Hr	1-Hr		8-Hr		1-Hr	24-Hr		24-Hr*		24-Hr**
	Nat.	Cal.	Cal.	Nat.	Cal.	Nat.	Cal.	Cal.	Nat.	Cal.	Nat.	Cal.	Nat.
1998	16	29	--	0	0	0	0	0	0	0	0	5	--
1999	9	20	--	0	0	0	0	0	0	0	0	12	--
2000	4	12	--	0	0	0	0	0	0	0	0	7	1
2001	7	15	--	0	0	0	0	0	0	0	0	10	5
2002	7	16	--	0	0	0	0	0	0	0	0	6	7
2003	7	19	--	0	0	0	0	0	0	0	0	6	0
2004	0	7	--	0	0	0	0	0	0	0	0	7	1
2005	1	9	9	0	0	0	0	0	0	0	0	6	0
2006	12	18	22	0	0	0	0	0	0	0	0	15	10
2007	1	4	9	0	0	0	0	0	0	0	0	4	14
2008	12	9	20	0	0	0	0	0	0	0	0	5	12

* PM10 is sampled every sixth day – actual days over standard can be estimated to be six times the numbers listed.

** On Dec. 17, 2006, the U.S. EPA implemented a more stringent national 24-hour PM2.5 standard – revising it from 5 g/m3 to 25 g/m3. PM2.5 exceedance days for 2006 and 2007 reflect the new standard.

Toxic Air Contaminants

Table 3-4 (BAAQMD, 2007) contains a summary of ambient air toxics monitoring data of toxic air contaminants (TACs) measured at monitoring stations in the Bay Area by the District in 2003. One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. A number of VOCs currently used in composite manufacturing and cleaning operations have also been identified as TACs, such as styrene.

For the last twenty-two years, the District's Air Toxics Program has sought to evaluate and reduce the public's exposure to TACs through the control of emissions from stationary sources. The District's Air Toxics Program, along with other programs in place at the State and national level, has significantly reduced ambient exposure to TACs from stationary sources, motor vehicles, fuels, and consumer products. Reformulated fuel and vapor recovery regulations have reduced concentrations of benzene (about 85 percent reduction) and 1,3-butadiene. MTBE has been eliminated from gasoline. Hexavalent chromium was prohibited in cooling towers and limited in chrome plating facilities so hexavalent chromium emissions have been reduced by about 80 percent. Perchloroethylene has been reduced dramatically because of state and BAAQMD dry cleaner rules (estimated 95 percent reduction). Cleaner-burning diesel engines and cleaner diesel fuel have reduced diesel concentrations over 50 percent (BAAQMD, 2009). Future toxic emission reductions mandated by the pending phase-out of perchloroethylene dry cleaners, multiple diesel regulations, and other local, state and federal toxics regulations will provide a continuation of these downward trends in toxic exposure.

TABLE 3-4

Summary of 2003 BAAQMD Ambient Air Toxics Monitoring Data

Compound	LOD (ppb)(1)	% of Samples < LOD(2)	Max. Conc. (ppb) (3)	Min. Conc. (ppb) (4)	Mean Conc. (ppb) (5)
Acetone	0.30	0	121.4	0.6	6.80
Benzene	0.10	1.78	2.4	0.5	0.401
1,3-butadiene	0.15	75.7	0.89	0.075	0.12
Carbon tetrachloride	0.01	0	0.16	0.09	0.108
Chloroform	0.02	62.5	1.47	0.01	0.024
Ethylbenzene	0.10	44.2	0.90	0.05	0.135
Ethylene dibromide	0.02	100	0.01	0.01	0.01
Ethylene dichloride	0.10	100	0.05	0.05	0.05
Methylene chloride	0.50	82.9	3.40	0.25	0.356
Methyl ethyl ketone	0.20	7.7	5.80	0.1	0.496
Metyl tert-butyl ether	0.30	32.9	4.80	0.15	0.532
Perchloroethylene	0.01	42.4	0.28	0.005	0.026
Toluene	0.10	0.2	6.0	0.05	1.062
1,1,1-Trichloroethane	0.05	72.3	2.47	0.025	0.084
Trichloroethylene	0.05	93.8	0.33	0.025	0.029
Trichlorofluoromethane	0.01	0	.046	0.18	0.266
1,1,2-trichlorotrifluoroethane	0.01	0	1.16	0.06	0.077
Vinyl chloride	0.30	100	0.15	0.15	0.15
m/p-xylene	0.10	2.8	3.40	0.05	0.535
o-xylene	0.10	27.9	1.30	0.05	0.186

NOTES: Table 3-4 summarizes the results of the BAAQMD gaseous toxic air contaminant monitoring network for the year 2003. These data represent monitoring results at 19 of the 20 separate sites at which samples were collected. Data from the Fort Cronkhite "clean-air" background site was not included. Data from the Oakland-Davie Stadium site was available from January through March.

(1) "LOD" is the limit of detection of the analytical method used.

(2) "% of samples < LOD" is the percent of the total number of air samples collected in 2003 that had pollutant concentrations less than the LOD.

(3) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.

(4) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites.

(5) "Mean Conc." is the arithmetic average of the air samples collected in 2003 at the 19 monitoring sites. In calculating the mean, samples with concentrations less than the LOD were assumed to be equal to one half the LOD concentration.

Regulatory Background

Criteria Pollutants

At the federal level, the Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state

ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the BAAQMD, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

The BAAQMD is governed by a 22-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The BAAQMD is responsible for implementing emissions standards and other requirements of federal and state laws. It is also responsible for developing air quality planning documents required by both federal and state laws.

Toxic Air Contaminants

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific National Emission Standards for Hazardous Air Pollutants (NESHAPs) were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards must be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed three regulatory programs for the control of TACs. Each of the programs is discussed in the following subsections.

Control of TACs under the TAC Identification and Control Program: California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), is a two-step program in which substances are identified as TACs, and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. Since adoption of the program, CARB has identified 18 TACs, and CARB adopted a regulation designating all 189 federal HAPs as TACs.

Control of TACs under the Air Toxics "Hot Spots" Act: The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with those emissions. Inventory reports must be updated every four years under current state law. The BAAQMD uses a maximum individual cancer risk of 10 per one million, or an ambient concentration above a non-cancer reference exposure level, as the threshold for notification.

Senate Bill (SB) 1731, enacted in 1992 (California Health and Safety Code §44390 et seq.), amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. At a minimum, such facilities must, as quickly as feasible, reduce cancer risk levels that exceed 100 per one million. The BAAQMD adopted risk reduction requirements for perchloroethylene dry cleaners to fulfill the requirements of SB 1731.

The District's efforts to reduce public exposure to TACs include the promotion of measures directed at reducing emissions from motor vehicles, which are the largest source of TACs. In 2004, the District initiated the Community Air Risk Evaluation (CARE) Program to investigate the cumulative impact of stationary, area, and mobile sources at a neighborhood-level. These investigations have confirmed that motor vehicle emissions, especially emissions of diesel PM, are the largest contributor to neighborhood-level health impacts from air pollution. The CARE Program identified a number of Bay Area communities that have comparatively high air pollution related health impacts and designated six "Priority Communities" where risk reduction efforts should be focused. The District is considering revisions to several stationary source air toxics programs that will require additional mitigation measures for stationary sources located in these Priority Communities. BAAQMD will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Greenhouse Gas Emissions

In June 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05, which established GHG emissions reduction targets for the state, as well as a process to ensure that the targets are met. As a result of this executive order, the California Climate Action Team (CAT), led by the Secretary of the California State Environmental Protection Agency (CalEPA), was formed. The CAT published its report in March 2006, in which it laid out several recommendations and strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The greenhouse gas targets are:

- By 2010, reduce to 2000 emission levels;
- By 2020, reduce to 1990 emission levels; and,

- By 2050, reduce to 80 percent below 1990 levels.

In September 2006, Governor Schwarzenegger signed California's Global Warming Solutions Act of 2006 (AB32). AB32 required CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008;

- Adopt mandatory reporting rules for significant sources of GHG emissions by January 1, 2008;

- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and

- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHGs by January 1, 2011.

SB1368, a companion bill to AB32, requires the CPUC and the CEC to establish GHG emission performance standards for the generation of electricity, whether generated inside the State, or generated outside, and then imported into California. SB1368 provides a mechanism for reducing the emissions of electricity providers, thereby assisting CARB to meet its mandate under AB32.

SB97, passed in August 2007, is designed to work in conjunction with CEQA and AB32. SB97 requires the California Office of Planning and Research (OPR) to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including but not limited to, effects associated with transportation and energy consumption. These guidelines were required to be transmitted to the Resources Agency by July 1, 2009 and to be certified and adopted by January 1, 2010. The OPR and the Resources Agency shall periodically update these guidelines to incorporate new information or criteria established by CARB pursuant to AB32. SB97 will apply to any EIR, negative declaration, mitigated negative declaration, or other document required by CEQA, prepared for a limited number of types of projects. SB 97 will be automatically repealed January 1, 2010.

Discussion of Impacts

III a. The objectives of the proposed rule amendments are aimed to increase the stringency of the standards for new and modified stationary sources of TACs in the BAAQMD, including new or modified diesel engines, gasoline dispensing facilities, and a variety of other commercial and industrial sources, such as gas fired combustion devices, crematories, petroleum refinery projects, cement plants, and landfills. Consequently, the proposed rule amendments are expected to reduce exposure to TACs and provide overall health benefits. A number of TACs that will be more strictly regulated are VOCs, and reduced VOC concentrations are necessary to attain the ambient air quality standards for ozone. Therefore, the proposed rule amendments are not expected to conflict with an Air Quality

Plan, but instead would further the objectives of the 2005 Ozone Strategy, ultimately reducing ozone concentrations in the Bay Area.

III b,d. The proposed project would not violate any ambient air quality standards, but, as noted above, would contribute to the BAAQMD's progress in reducing toxic risk and allow further progress towards attaining the ambient air quality standards for ozone as well. No significant adverse air quality impact is anticipated from installation of new abatement equipment or process changes that could occur at the potentially affected facilities. Some new equipment is expected to replace similar equipment in size, throughput, location, etc. Thus, no new foundations or support equipment (e.g., power lines to source, piping, etc.) are expected to be required, except for the rare case of a new large abatement system. The only construction activity is expected to be delivery, removal of old equipment and minor installation work (e.g., welding). The new abatement equipment is expected to be built and assembled offsite.

If equipment installation is required at more than one facility, it is highly unlikely the construction activity would take place on the same day. Thus, the construction activity calculated in Table 3-5 would be the peak daily construction emissions from the proposed project. As shown in Table 3-5, the delivery and installation of the one piece of equipment would not exceed the BAAQMDs existing or proposed NOx significance threshold (54 pounds per day) from the construction phase of the project. It is assumed for a worst-case scenario, one crane and one welder would be necessary to install the equipment.

The direct air quality impact from regulating a TAC is a reduction in toxic risk, thus a related air quality and health risk. The proposed rule amendments are expected to reduce emissions from TACs and reduce the related health impacts as additional TACs would be regulated. Therefore, TAC exposure to sensitive receptors would be reduced. Any potential adverse environmental impacts from adding age sensitivity factors to health risk calculation procedures or from revising health effects values for TACs would typically be secondary or cross-media impacts generated by the installation and operation of new air pollution control equipment. However, because of the sources types potentially affected (e.g., gasoline dispensing facilities and diesel engines), the risk reduction measures would most likely involve product or equipment replacement (Tier 3 or 4 engines) or process change (e.g., reduction in use or throughput or altered facility practices).

TABLE 3-5

Construction Emissions from Equipment Installation (Year 2010)

Equipment Type	Distance Traveled (miles/day)	Hours of Daily Operation	NOx Emission Factor[1]	NOx Emissions (pounds/day)	Total NOx Emissions (pounds/day)
Heavy –duty delivery truck	50	n/a	0.03822102 pounds/mile[2]	1.9	9.6
Crane	On-site	4	1.4515 pounds/hour[3]	5.8	
Welder	On-site	6	0.2920 pounds/hour[3]	1.8	
Employee Vehicle	75[4]	n/a	0.00091814 pounds/mile[5]	0.07	

1. NOx was used as the driver because it would be criteria pollutant with highest emissions.
2. Source : EMFAC2007 Emission Factors http ://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls
3. Because the horsepower of the equipment is unknown at this time, the composite factor was used. Source : http ://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls
4. Assumes 25 mile roundtrip for three construction employees (25 miles/day x 3 = 75 miles/day).
5. Source : EMFAC2007 Emission Factors for On-Road Passenger Vehicles http ://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

III c. Implementing the proposed project is not expected to require the construction of new structures. Since the proposed amendments to Regulation 2-5 is not expected to generate significant adverse project-specific construction or operational air quality impacts, it is not expected to cause cumulative impacts in conjunction with other projects that may occur concurrently with or subsequent to the proposed project (CEQA Guidelines §15130(a)). Because the equipment replacement is expected to be identical of similar in process, if not more efficient, any operational GHG emissions are also expected to be identical or less than current equipment. The proposed project's contribution to a potentially significant cumulative impact is rendered less than cumulatively considerable and, thus, is not significant (CEQA Guidelines §15064(h)(2)).

III e. Objectionable odors are often associated with a number of polluting sources. To the extent that the proposed project could result in equipment replacement or process changes, odors may continue or cease to be experienced. It is expected that implementing the proposed project will provide a benefit by reducing population exposures from odors associated with TACs. Therefore, no significant adverse odor impacts are expected from implementing the proposed project and impact assessment for facilities subject to Regulation 2-5.

III f. The proposed project will not diminish an existing air quality rule or future compliance requirement. The analysis concludes that the proposed project will provide air quality benefits from TACs and cancer risk reduction. Secondary impacts from risk reduction actions, equipment replacement or process changes, is not expected to change or worsen the existing air quality conditions at the affected facilities and, therefore, any potential adverse air quality impact from the proposed project is not significant.

Based on the above consideration, significant adverse impacts to air quality are not expected from amendments to Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e) Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. A wide variety of biological resources are located within the Bay Area.

The entire area under the jurisdiction of the BAAQMD is affected by the proposed rule amendments, and is located within the Bay Area-Delta Bioregion (as defined by the State's Natural Communities Conservation Program). This Bioregion is comprised of a variety of natural communities, which range from salt marshes to chaparral to oak woodland. A majority of the affected areas have been graded to develop various commercial or residential structures. Native vegetation, other than landscape vegetation, has generally been removed from areas to minimize safety and fire hazards. Any new development would fall under the requirements of the City or County General Plans.

Regulatory Background

Biological resources are generally protected by the City and/or County General Plans through land use and zoning requirements which minimize or prohibit development in biologically sensitive areas. Biological resources are also protected by the California Department of Fish and Game, and the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service and National Marine Fisheries Service oversee the federal Endangered Species Act. Development permits may be required from one or both of these agencies if development would impact rare or endangered species. The California Department of Fish and Game administers the California Endangered Species Act which prohibits impacting endangered and threatened species. The U.S. Army Corps of Engineers and the U.S. EPA regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

Discussion of Impacts

IV a,b,d. No impacts on biological resources are anticipated from the proposed rule amendments which would apply to facilities which are primarily located in industrial and commercial areas, which generally lack native vegetation. The proposed amendments are not expected to require the construction of any major new facilities and would not require construction activities outside of existing facilities. The construction associated with the installation of such units is expected to be minor and would be installed at the time other equipment would be installed. New equipment generally would be fabricated off-site at the manufacturing facility, delivered to the site, and installed. Most areas where commercial and industrial facilities are located have typically been graded and developed, and biological resources, with the exception of landscape species, have generally been removed. The amendments to Regulation 2-5 would not require development outside of existing areas and would not impact any native biological resources.

IV c. Acquisition of protected wetlands is not expected to be necessary to reduce the cancer risk from TACs in the BAAQMD. Operators of affected facilities would replace equipment or reduce hours of operation which would not require removing, filling or interrupting any hydrological system or have an adverse effect on federally protected wetlands.

IV e-f. There are no provisions in the proposed rule that would adversely affect land use plans, local policies or ordinances, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Amendments to Regulation 2-5 would not affect in any way habitat

conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities.

Based on the above consideration, significant adverse impacts to biological resources are not expected from Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside a formal cemeteries?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural and open space uses. Cultural resources are defined as buildings, sites, structures, or objects which might have historical architectural, archaeological, cultural, or scientific importance.

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. This locality lies within the San Francisco Bay and the west end of the Central Valley archaeological regions, both of which contain a rich array of prehistoric and historical cultural resources. The areas surrounding the Carquinez Strait and Suisun Bay have been occupied for millennia given their abundant combination of littoral and oak woodland resources. The facilities affected by the proposed rule amendments to Regulation 2-5 are primarily located in industrial and commercial areas of the BAAQMD which have been graded and developed.

Regulatory Background

The State CEQA Guidelines define a significant cultural resource as a “resource listed or eligible for listing on the California Register of Historical Resources” (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5(b)). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the

historical resource that convey its historical significance and that qualify the resource for inclusion in the California Register of Historical Resources or a local register or survey that meets the requirements of Public Resources Code Sections 50020.1(k) and 5024.1(g).

Discussion of Impacts

V a – d. There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Affected facilities will not be required to perform major construction activities such as grading, trenching, etc., to comply with the proposed rule amendments. Equipment replacement is expected to take place on the same foundation already previously graded and paved. Therefore, cultural resources would not be disturbed. As a result, the proposed project has no potential to cause a substantial adverse change to a historical or archaeological resource, directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or disturb any human remains, including those interred outside a formal cemeteries.

Based on the above consideration, significant adverse impacts to cultural resources are not expected from amendments to Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☑
• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☑
• Strong seismic groundshaking?	☐	☐	☐	☑
• Seismic–related ground failure, including liquefaction?	☐	☐	☐	☑
• Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☑
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Facilities affected by the proposed rule amendments are located primarily in industrial and commercial areas within the jurisdiction of the BAAQMD.

The Bay Area is located in the natural region of California known as the Coast Ranges geomorphic province. The province is characterized by a series of northwest trending ridges

and valleys controlled by tectonic folding and faulting, examples of which include the Suisun Bay, East Bay Hills, Briones Hills, Vaca Mountains, Napa Valley, and Diablo Ranges.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone inter-fingered with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along “active” faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

Regulatory Background

Construction is regulated by the local City or County building codes that provide requirements for construction, grading, excavations, use of fill, and foundation work including type of materials, design, procedures, etc., which are intended to limit the probability of occurrence and the severity of consequences from geological hazards. Necessary permits, plan checks, and inspections are generally required.

The City or County General Plan includes the Seismic Safety Element. The Element serves primarily to identify seismic hazards and their location in order that they may be taken into account in the planning of future development. The Uniform Building Code is the principle mechanism for protection against and relief from the danger of earthquakes and related events.

In addition, the Seismic Hazard Zone Mapping Act (Public Resources Code §§2690 – 2699.6) was passed by the California legislature in 1990 following the Loma Prieta earthquake. The Act required that the California Division of Mines and Geology (DMG) develop maps that identify

the areas of the state that require site specific investigation for earthquake-triggered landslides and/or potential liquefaction prior to permitting most urban developments. The act directs cities, counties, and state agencies to use the maps in their land use planning and permitting processes.

Local governments are responsible for implementing the requirements of the Seismic Hazards Mapping Act. The maps and guidelines are tools for local governments to use in establishing their land use management policies and in developing ordinances and review procedures that will reduce losses from ground failure during future earthquakes.

Discussion of Impacts

VI a. Facilities affected already exist so the proposed project will not expose people to substantial geological effects greater than what they are exposed to already. Since the proposed rule amendments will not require any additional major equipment beyond what is already operating, amendments to Regulation 2-5 will not expose people or structures to risks of loss, injury, or death involving: rupture of an earthquake fault, seismic ground shaking, ground failure or landslides.

VII b. The proposed project will not require major construction activities (e.g., grading, trenching, refilling and repaving), so no potential impacts to existing geophysical conditions are anticipated. Because affected facilities are primarily located at existing sites on established foundations, no soil will need to be disrupted. Therefore, no substantial soil erosion or loss of topsoil is expected from the existing affected facilities as a result of controlling emissions and toxic risk from TACs in the BAAQMD.

VII c and d. Affected facilities are primarily located at existing sites and, therefore, will not involve locating any structures on soil that is unstable or expansive. However, as already noted, no soil disturbance is anticipated from the proposed project, therefore, no further destabilization of unstable soils would be expected that could cause on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

VII e. The proposed project does not involve the installation of septic tanks or alternative waste water disposal systems. Therefore, this type of soil impact will not occur.

Based on the above considerations, significant adverse impacts to geology and soils are not expected from amendments to Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☑
c)	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☑
d)	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e)	Be located within an airport land use plan or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f)	Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑
i)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☐	☑[

Setting

The affected industrial/commercial facilities handle and process measurable quantities of flammable, hazardous, and acutely hazardous materials. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

Hazards are related to the risks of fire, explosions, or releases of hazardous substances in the event of accident or upset conditions. Hazards are thus related to the production, use, storage, and transport of hazardous materials. Industrial production and processing facilities are potential sites for hazardous materials. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production processes. Examples of hazardous materials used by consumers include fuels, paints, paint thinner, nail polish, and solvents. Hazardous materials may be stored at facilities producing such materials and at facilities where hazardous materials are part of the production processes. Storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the Bay Area in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with handling such materials are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facilities where they exist. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events.

- Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases): The rupture of a storage tank or vessel containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The “worst-case” upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- Thermal Radiation: Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- Explosion/Overpressure: Process vessels containing flammable explosive vapors and potential ignition sources are present at many types of industrial facilities. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source.

An explosion could cause impacts to individuals and structures in the area due to overpressure.

Regulatory Background

The use, storage and transport of hazardous materials are subject to numerous laws and regulations at all levels of government. The most relevant existing hazardous materials laws and regulations include hazardous materials management planning, hazardous materials transportation, hazardous materials worker safety requirements, hazardous waste handling requirements, and emergency response to hazardous materials and waste incidents. There are many federal and state rules and regulations that facilities handling hazardous materials must comply with which serve to minimize the potential impacts associated with hazards at these facilities.

Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program.

Affected facilities that store materials are required to have a Spill Prevention Control and Countermeasures (SPCC) Plan per the requirements of 40 CFR, Section 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the U.S. Department of Transportation at the earliest practical moment (49 CFR Subchapter C). The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

Contra Costa County has adopted an industrial safety ordinance that addresses the human factors that lead to accidents. The ordinance requires stationary sources to develop a written human factors program that considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

Discussion of Impacts

VII a - c. Equipment replacement or process changes are not expected to require any new transport, use, or disposal of hazardous materials, thus, no new significant hazard to the public or the environment from a release of hazardous materials will occur as a result of the proposed beyond the current risk of upset. So, for a worst-case scenario, the hazard impacts from commercial and industrial operations remain constant from the current condition. Because no new transport of hazardous materials will occur as a result of the proposed project, emissions of hazardous emissions, or handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school will not occur as a result of the proposed project. Consequently, proposed amended Regulation 2-5 will not create a significant new hazard to the public or create a reasonably foreseeable upset condition involving the release of hazardous materials.

VII d. No impacts on hazardous material sites are anticipated from the proposed rule amendments. Some of the affected areas may be located on the hazardous materials sites list pursuant to Government Code Section 65962.5. However, the proposed rule amendments would have no affect on hazardous materials nor would the amendment create a significant hazard to the public or environment. Affect facilities are primarily located and operated within the confines of industrial and commercial facilities. The proposed rule amendments neither require, nor are likely to result in, activities that would affect existing site contamination or change existing hazardous waste management practices. Therefore, no significant adverse impacts on hazards are expected.

VII e – f. Regardless of whether or not affected facilities are located near airports or private airstrips, the proposed project will not create new safety hazards. No new hazards will be introduced at affected facilities that could create safety hazards at local airports or private airstrips.

VII g. The proposed project could result in equipment replacement or process changes. However, the proposed rule amendments are not expected to physically interfere with implementing adopted emergency response plans and emergency evacuation plans.

VII h-i. Since the proposed rule amendments will not require any changes to the affected facility or operational process that will expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Because affected facility operations are not expected to change substantially, except for possibly a reduction in the annual hours of operation, there will be not significant increase of fire hazards in areas with flammable materials than what currently exists already.

Based on the above considerations, significant adverse impacts to hazards and hazardous materials are not expected from Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY. Would the project:					
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☑
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	☐	☐	☐	☑
d)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☐	☑
e)	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☑
f)	Otherwise substantially degrade water quality?	☐	☐	☐	☑
g)	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h)	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and affected environment vary substantially throughout the area and include commercial, industrial, residential, agricultural, and open space uses.

Facilities affected by the proposed rule amendments are primarily located in industrial and commercial areas within the Bay Area. Reservoirs and drainage streams are located throughout the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The Bay Area is located within the San Francisco Bay Area Hydrologic Basin. The primary regional groundwater water-bearing formations include the recent and Pleistocene (up to two million years old) alluvial deposits and the Pleistocene Huichica formation. Salinity within the unconfined alluvium appears to increase with depth to at least 300 feet. Water of the Huichica formation tends to be soft and relatively high in bicarbonate, although usable for domestic and irrigation needs.

Regulatory Background

The Federal Clean Water Act of 1972 primarily establishes regulations for pollutant discharges into surface waters in order to protect and maintain the quality and integrity of the nation's waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The 1987 amendments to the Clean Water Act enabled the U.S. EPA to regulate, under the National Pollutant Discharge Elimination System (NPDES) program, discharges from industries and large municipal sewer systems. The U.S. EPA set initial permit application requirements in 1990. The State of California, through the State Water Resources Control Board (SWRCB), has authority to issue NPDES permits, which meet U.S. EPA requirements, to specified industries.

The Porter-Cologne Water Quality Act is California's primary water quality control law, which implements the state's responsibilities under the Federal Clean Water Act but also establishes state wastewater discharge requirements. The Regional Water Quality Control Board (RWQCB) administers the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay RWQCB.

In response to the Federal Act, the State Water Resources Control Board (SWRCB) prepared two state-wide plans in 1991 and 1995 that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan, which have been updated in 2005 as the Policy for Implementation of Toxics Standards for Inland Surface

Waters, Enclosed Bays, and Estuaries of California. Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. San Francisco Bay, and its constituent parts, including Carquinez Strait and Suisun Bay, fall under this category.

The San Francisco Bay Basin Plan identifies the: (1) beneficial water uses that need to be protected; (2) the water quality objectives needed to protect the designated beneficial water uses; and (3) strategies and time schedules for achieving the water quality objectives. The beneficial uses of the Carquinez Strait that must be protected include water contact and non-contact recreation, navigation, ocean commercial and sport fishing, wildlife habitat, estuarine habitat, fish spawning and migration, industrial process and service supply, and preservation of rare and endangered species.

Discussion of Impacts

VIII a,b,f. None of proposed amendments are expected to have direct or indirect impact on hydrology and water quality because operators at affected facilities are not expected to use water to a greater extent than they currently use. Therefore, amendments to Regulation 2-5 will not adversely affect water resources, water quality standards, groundwater supplies or water quality degradation.

VIII c-e. The proposed project would primarily affect operations at existing facilities. As discussed previously, no major construction activities will be necessary to comply with amendments to Regulation 2-5, so the proposed project will not alter any existing drainage patterns, nor increase the rate or amount of surface runoff water that would exceed the capacity of existing or planned stormwater drainage systems.

VIII g and h. Amendments to Regulation 2-5 do not involve or require the construction of housing so it will not result in placing housing in a 100- year flood hazard areas that could create new flood hazards. The proposed project would affect operations at existing industrial and commercial facilities so any flood hazards would be part of the existing setting.

VIII i and j. Amendments to Regulation 2-5 primarily reduce TACs in the BAAQMD and risk at existing facilities and do not require construction of new structures. The amendments will not create new flood risks or risks from seiches, tsunamis or mudflow conditions. Any risks from seiches, tsunamis, or mudflows would be part of the existing setting.

Based upon these considerations, no significant adverse hydrology and water quality impacts are expected from the implementation of the proposed rule amendments.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX.	**LAND USE AND PLANNING.** Would the project:				
a)	Physically divide an established community?	☐	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The facilities affected by the proposed rule amendments are primarily located within industrial and commercial areas of the BAAQMD.

Regulatory Background

Land uses are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

IX a. Since amendments to Regulation 2-5 primarily reduce toxic emissions and risk, the proposed project will not create divisions in any existing communities because this provision applies generally to operations at existing facilities. Similarly, the proposed project does not require construction of new structures that could physically divide an established community. Any new structures would be built for reasons other than to comply with the proposed project, such as starting a new, or relocating an existing business.

IX b and c. No provisions of the proposed amendments to Regulation 2-5 would directly affect applicable land use plans, zoning ordinances, habitat conservation, or natural community conservation plans. Any changes required to existing facilities are expected to occur within the confines of existing commercial and industrial facilities. No construction activities outside of

the confines of existing facilities are expected to be required due to the adoption of the proposed amendments to Regulation 2-5, so no impacts on land use are expected. Operations at affected facilities would still be expected to comply, and not interfere, with any applicable land use plans, zoning ordinances, habitat conservation or natural community conservation plans. There are no provisions of the proposed project that would directly affect these plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no present or planned land uses in the region or planning requirements will be altered by the proposed project.

Based upon these considerations, no significant adverse impacts to land use are expected due to the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the proposed rule amendments are primarily located within industrial and commercial areas of the BAAQMD.

Regulatory Background

Mineral resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

X a-b. There are no provisions of the proposed rule that would directly result in the loss of availability of a known mineral resource, such as aggregate, coal, shale, etc., of value to the region and the residents of the state, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. The proposed rule amendments are aimed at increasing the stringency of the standards for new and modified stationary sources of TACs in the BAAQMD. Based on the above considerations, significant adverse impacts to mineral resources are not expected from the proposed amendments to Regulation 2-5. Since there are no significant adverse impacts, no mitigation measures are required.

Based upon these considerations, significantly adverse impacts to mineral resources not expected from the implementation of the proposed amendments to Regulation 2-5.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI.	**NOISE.** Would the project:				
a)	Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☑
b)	Expose persons to or generate of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑
c)	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
d)	Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
e)	Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f)	Be located within the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The industrial operations affected by the proposed rule amendments are primarily located within industrial and commercial areas of the BAAQMD.

Regulatory Background

Noise issues related to construction and operational activities are addressed in local General Plan policies and local noise ordinance standards. The General Plan and noise ordinances generally establish allowable noise limits within different land uses including residential areas, other sensitive use areas (e.g., schools, churches, hospitals, and libraries), commercial areas, and industrial areas.

Discussion of Impacts

XI a-d. Amendments to Regulation 2-5 will not generate additional or new noise, excessive ground-borne vibration, or substantially increase ambient noise levels beyond existing levels. No major construction activities would be required due to the adoption of the proposed amendments to Regulation 2-5 so that no noise impacts associated with the use of construction equipment and construction-related traffic are expected. Any new equipment is expected to produce similar, if not less noise levels, than the current older equipment. Affected facilities who do choose to operate equipment fewer hours per year to reduce toxic risk will produce less noise and vibration, which is considered to be a benefit. As a result, the proposed rule would have no new or additional noise impacts, but may produce beneficial effects relative to noise produced by affected equipment or process.

XI. e-f. As indicated in the preceding discussion, noise levels will either not change or will decline as a result of the proposed project and, therefore, will have a neutral effect on noise levels from affected facilities that may be located within two miles of an airport or private airstrip.

Based upon these considerations, significant noise impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities operations affected by the proposed rule amendments are primarily located in industrial and commercial areas within the jurisdiction of the BAAQMD.

Regulatory Background

Population and housing growth and resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

XII. a-c. Human population in the BAAQMD's jurisdiction is anticipated to grow regardless of implementing the proposed project. The proposed rule amendments are aimed at increasing the stringency of the standards for new and modified stationary sources of TACs in the BAAQMD, which will not require additional employees at affected facilities. If replacing equipment, a temporary construction crew would be required to conduct the installation of new equipment. This crew would be expected to come from the existing vast labor market in the region and would not require displacement of population or housing. Therefore, the district population will not be affected directly or indirectly as a result of adopting and implementing amendments to Regulation 2-5. The construction of single- or multiple-family housing units would not be required as a result of implementing the proposed project since no new employees will be required at affected facilities. The proposed project will not require relocation of

affected facilities, so existing housing or populations in the district are not anticipated to be displaced necessitating the construction of replacement housing elsewhere.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. PUBLIC SERVICES. Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☐	☑
Police protection?	☐	☐	☐	☑
Schools?	☐	☐	☐	☑
Parks?	☐	☐	☐	☑
Other public facilities?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the proposed rule amendments are located throughout the area within the jurisdiction of the BAAQMD, primarily in industrial and commercial areas.

Given the large area covered by the BAAQMD, public services are provided by a wide variety of local agencies. Fire protection and police protection/law enforcement services within the BAAQMD are provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate public services are maintained within the local jurisdiction.

Discussion of Impacts

XIII a. The proposed project will not involve the use of acutely hazardous materials. Thus, no new fire hazards or increased use of hazardous materials would be introduced at existing affected facilities. Thus, no new demands for fire or police protection are expected from implementing amendments to Regulation 2-5 and implementation will not require actions warranting additional fire or police protection.

As noted in the "Population and Housing" discussion, implementing amendments to Regulation 2-5 will not require major construction or permanent employees to continue operation at existing affected facilities. The employees required for the day replacement of equipment is expected to come from the extensive existing labor pool in the region and, as a result, the proposed project will have no direct or indirect effects on population growth in the district. Consequently, no new impacts to schools, parks or other recreational facilities are foreseen as a result of implementing the proposed project.

Because the reduction in cancer risk only requires minor modifications at affected facilities, the proposal would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times or other performance objectives.

Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. RECREATION. Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that there are numerous areas for recreational activities. The facilities affected by the proposed rule amendments are primarily located in industrial and commercial areas throughout the BAAQMD.

Regulatory Background

Recreational areas are generally protected and regulated by the City and/or County General Plans at the local level through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

Discussion of Impacts

XIV a-b. As discussed under "Land Use and Planning" above, there are no provisions in the proposed project that would affect land use plans, policies or ordinances, or regulations. Land use and other planning considerations are determined by local governments; no land use or planning requirements will be altered by the proposal. As already noted in item XII, Population and Housing, the proposed project is not expected to increase population growth in the district because no additional operational employees would be required at affected facilities and construction employees will be a small number, needed temporarily, and can be obtained from the extensive existing labor pool in the region. Therefore, no additional demand for recreation facilities is anticipated. Further, the proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities or include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Based upon these considerations, significant recreation impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC. Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☑
b) Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards because of a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑
f) Result in inadequate parking capacity?	☐	☐	☐	☑
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles). Transportation systems located within the Bay Area include railroads, airports, waterways, and highways. The Port of Oakland and three international airports in the area serve as hubs for commerce and transportation. The transportation infrastructure for vehicles and trucks in the Bay Area ranges from single lane roadways to multi-lane interstate highways. The Bay Area contains over 19,600 miles of local streets and roads, and over 1,400 miles of state highways. In addition, there are over 9,040 transit route miles of services including rapid rail, light rail, commuter, diesel and electric buses, cable cars, and ferries. The Bay Area also has an extensive local system of bicycle routes and pedestrian paths and sidewalks.

The region is served by numerous interstate and U.S. freeways. On the west side of San Francisco Bay, Interstate 280 and U.S. 101 run north-south. U.S. 101 continues north of San Francisco into Marin County. Interstates 880 and 660 run north-south on the east side of the Bay. Interstate 80 starts in San Francisco, crosses the Bay Bridge, and runs northeast toward Sacramento. Interstate 80 is a six-lane north-south freeway which connects Contra Costa County to Solano County via the Carquinez Bridge. State Routes 29 and 84, both highways that allow at-grade crossings in certain parts of the region, become freeways that run east-west, and cross the Bay. Interstate 580 starts in San Rafael, crosses the Richmond-San Rafael Bridge, joins with Interstate 80, runs through Oakland, and then runs eastward toward Livermore. From the Benicia-Martinez Bridge, Interstate 680 extends north to Interstate 80 in Cordelia. Caltrans constructed a second freeway bridge adjacent and east of the existing Benicia-Martinez Bridge. The new bridge consists of five northbound traffic lanes. The existing bridge was re-striped to accommodate four lanes for southbound traffic. Interstate 780 is a four lane, east-west freeway extending from the Benicia-Martinez Bridge west to I-80 in Vallejo.

Regulatory Background

Transportation planning is usually conducted at the state and county level. Planning for interstate highways is generally done by the California Department of Transportation.

Most local counties maintain a transportation agency that has the duties of transportation planning and administration of improvement projects within the county and implements the Transportation Improvement and Growth Management Program, and the congestion management plans (CMPs). The CMP identifies a system of state highways and regionally significant principal arterials and specifies level of service standards for those roadways. The Metropolitan Transportation Commission is the main transportation planning agency in the Bay Area.

Discussion of Impacts

XV a,b,f. As noted in the "Discussion" sections of other environmental topics, compliance with the proposed amendments to Regulation 2-5 is not expected to require major construction to install new equipment, either to the equipment or at the site, e.g., site preparation, construction, etc. If replacing equipment, delivery of new equipment and transport for workers to install the new equipment would result in an estimated four additional vehicle trips on the road. The construction, however, is expected to be minor and temporary. Four additional vehicle trips on a given day is not expected to generate significant increase in traffic. Continuing operation at affected facilities will add no new trips because no new employees are expected to be required.

XV c. Air traffic patterns are not expected to be directly or indirectly affected by the proposed rule amendments because the implementation of the risk reduction measures does not involve new additional transport of products beyond what is currently transported by air nor will operation at existing facilities interfere with air traffic. All applicable local, state and federal requirements would continue to be complied with so no increase in any safety risks is expected.

XV d - e. Implementing amendments to Regulation 2-5 does not have direct or indirect impacts on specific construction design features because the proposed project does not require or induce the construction of any roadways or other transportation design features. In addition, the proposed project affects existing facilities and is not expected to result in inadequate emergency access beyond what already currently exists.

XV g. Affected facilities would still be expected to comply with, and not interfere with adopted policies, plans, or programs supporting alternative transportation. The proposed project will reduce cancer risk from TACs in the BAAQMD and has no provision that will hinder compliance with any applicable alternative transportation plans or policies.

Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements needed?	☐	☐	☐	☑
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☑
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area.

Given the large area covered by the BAAQMD, public utilities are provided by a wide variety of local agencies. The most affected facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of NPDES permits.

Water is supplied to affected facilities by several water purveyors in the Bay Area. Solid waste is handled through a variety of municipalities, through recycling activities and at disposal sites.

There are no hazardous waste disposal sites within the jurisdiction of the BAAQMD. Hazardous waste generated at the various industrial operations, which is not recycled off-site, is required to be disposed of at a licensed hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate utilities and service systems are maintained within the local jurisdiction.

Discussion of Impacts

XVI a. Because reducing toxic risk from the affected facilities does not require water, no changes to any existing wastewater treatment permits would be necessary. Any additional equipment is not expected to require any additional water use. Because of the source types potentially affected, the risk reduction measures would most likely involve product or equipment replacement (e.g., Tier 3 or 4 engines) or process change (e.g., reduction in use or throughput or altered facility practices). The replaced equipment is expected to be identical or similar in process, if not more efficient, so any water use is expected to be identical or less than current equipment. As a result, the proposed project is not expected to impact any affected facility's ability to comply with existing wastewater treatment requirements or conditions from any applicable Regional Water Quality Control Board or local sanitation district.

XVI b-c. Because reducing toxic risk emissions from the affected facilities does not require water as part of the control equipment or control process, no increase in wastewater from complying with the proposed project that could exceed the capacity of existing stormwater drainage systems or require the construction of new wastewater or stormwater drainage facilities is anticipated.

XVI d-e. The proposed project could result in equipment replacement or process changes. None of these activities are expected to have direct or indirect impact on hydrology and water quality because operators at affected facilities are not expected to use water to a greater extent than they currently use for cleaning, etc., because no additional water is required and the new equipment type is expected to be similar to the equipment being replaced. Therefore, the

proposed amendments to Regulation 2-5 will not adversely affect existing water supplies or wastewater treatment facilities.

Based upon these considerations no significant adverse utilities and service systems impacts are expected from the implementation of the proposed rule amendments.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII.	**MANDATORY FINDINGS OF SIGNIFICANCE.**				
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☑
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☐	☑
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

Discussion of Impacts

XVII a. As discussed in items I through XVII above, amendments to Regulation 2-5 and impact to facilities subject to Rule 2-5 have no potential to cause significant adverse environmental effects because the potential impacts from implementing risk reductions measures at affected facilities are less than significant. Therefore, the proposed project is not expected to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal. Similarly, the proposed project includes no provision that would eliminate important examples of the major periods of California history or prehistory or otherwise degrade cultural resources.

XVII b. Based on the foregoing analyses, since amendments to Regulation 2-5 and impact to facilities subject to Regulation 2-5 will not result in project-specific significant environmental impacts, the proposed project is not expected to cause cumulative impacts in conjunction with other projects that may occur concurrently with or subsequent to the proposed project. Furthermore, the proposed project impacts will not be "cumulatively considerable" because the incremental impacts are not considerable when viewed in connection with the effects of past, current, or probable future projects.

XVII c. Based on the foregoing analyses, amendments to Regulation 2-5 and impact assessment for facilities subject to Regulation 2-5 is not expected to cause significant adverse effects on human beings, either directly, or indirectly

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CHAPTER 4

REFERENCES

Bay Area Air Quality Management District (BAAQMD), 2007. Toxic Air Contaminant Control Program Annual Report 2003 Volume I. August 2007.

BAAQMD, 2009. Rule Development Staff Report, Proposed Amendments to Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants, November, 2009.

RULE DEVELOPMENT STAFF REPORT

DECEMBER 2009

Proposed Amendments to:

Regulation 2: Permits, Rule 5: New Source Review of Toxic Air Contaminants

Appendix G:

Socioeconomic Impact Analysis

PROPOSED CHANGES TO REGULATION 2, RULE 5 AND THE HEALTH RISK SCREENING ANALYSIS (HRSA) GUIDELINES: SOCIOECONOMIC IMPACT ANALYSIS

NOVEMBER 13, 2009

Prepared for

BAAQMD

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APPLIED DEVELOPMENT

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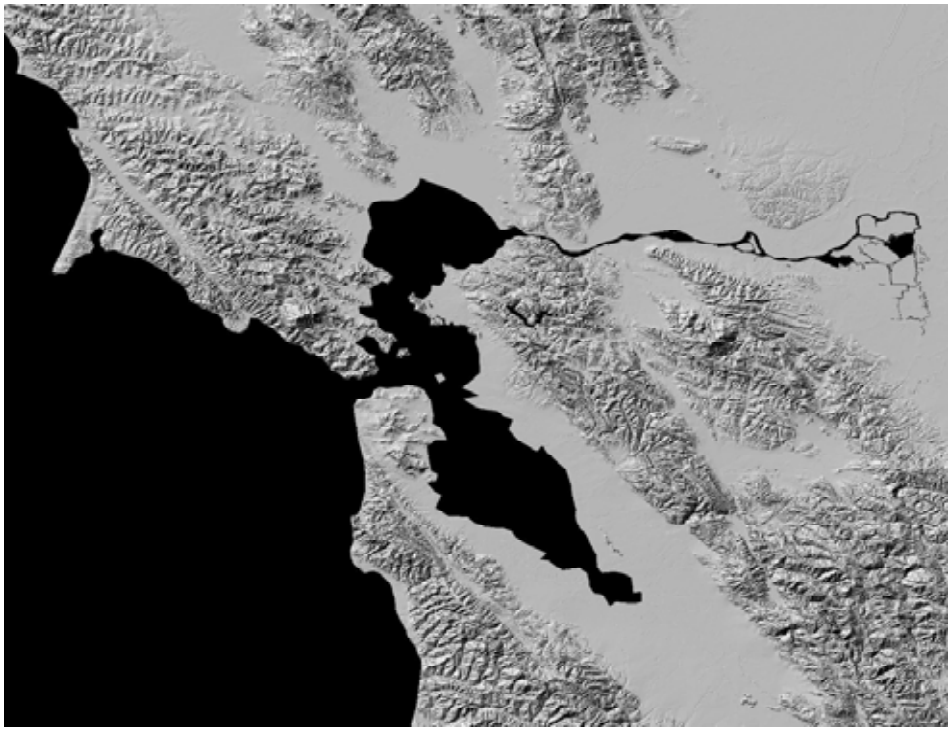
SECTION ONE: INTRODUCTION

This report describes the socioeconomic impacts of a proposal to incorporate age sensitivity factors in Regulation 2, Rule 5 and the Health Risk Screening Analysis Guidelines. Following this introduction, the report summarizes Regulation 2, Rule 5 ("Rule 2-5") and the Health Risk Screening Analysis ("HRSA") Guidelines. In Section Three, we describe the methodology for the socioeconomic analysis. Following this, we discuss economic and demographic contexts within which District staff and officials are contemplating changes to Rule 2-5 and the HRSA Guidelines. The fifth section analyzes the socioeconomic impacts of compliance costs on the affected sources and the regional economy.

The report is prepared pursuant to the provisions of AB2051 (Section 40728.5 of the California Health and Safety Code), which requires an assessment of socioeconomic impacts of proposed air quality rules. The findings in this report can assist District staff in understanding the socioeconomic impacts of the proposed requirements, and can assist staff in preparing a refined version of the rule. Figure 1 is a map of the nine-county region that comprises the San Francisco Bay Area Air Basin.



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SECTION TWO: BACKGROUND OF REGULATION 2, RULE 5 AND HEALTH RISK SCREENING ANALYSIS

This section of the report summarizes the Bay Area Air Quality Management District's ("District") Toxic NSR program, and how the District seeks to achieve goals and objectives of the Toxic NSR program. This section also discusses vital parts of the Toxic NSR program, namely the District's Health Risk Screening Analysis Guidelines.

As part of its efforts to reduce TAC emissions and associated health risks in the Bay Area, the District developed guidelines for conducting health risk screening analyses. The District requires HRSAs pursuant to Regulation 2 Permits, Rule 1 General Requirements or Rule 5 New Source Review of Toxic Air Contaminants, which are conducted in accordance with these guidelines. HRSA generally conform to the Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. In addition, these guidelines are in accordance with State risk assessment and risk management policies and guidelines in effect as of June 1, 2009.

Through the rule development process, the District will periodically update Regulation 2, Rule 5 and the HRSA guidelines to clarify procedures, amend health effects data, or incorporate other revisions to regulatory guidelines. Right now, the District is contemplating a proposal to incorporate age sensitivity factors (ASF) in the health risk assessment procedures and to update health effects values for numerous toxic air contaminants. Incorporating age sensitivity factors would result in a 70 percent increase in cancer risk estimates for residential receptors. The health effects value changes mainly concern non-cancer health impacts, and the results of these changes will generally be small in comparison the cancer risk impacts expected due to the use of ASFs. As part of its due diligence efforts, the District reviewed recent risk assessment data for the three most common source categories to determine how this proposed cancer risk calculation procedure change may impact future projects. These source categories are diesel-fired emergency generator engines, gasoline dispending facilities (GDFs), and crematories. See Appendix A for a District-issued memo on the proposed risk calculation procedure change and the three source categories.

SECTION THREE: METHODOLOGY

Applied Development Economics (ADE) began the analysis by preparing a statistical description of the industry groups of which the affected sources are a part, analyzing data on the number of establishments, jobs, and payroll. We also estimated sales generated by impacted industries, as well as net profits for each affected industry.

This report relies heavily on the most current data available from a variety of sources, such as the 2002 Economic Census, US Bureau of Labor Statistics, the State of California's Employment Development Department (EDD) Labor Market Information Division, and US Securities and Exchange Commission. For purposes of estimating profits, ADE reviewed industry-specific financial ratios issued by the US Internal Revenue Services. For purposes of estimating revenues generated by gasoline dispensing facilities (GDFs), ADE relied on California Board of Equalization for data on gas stations in the nine-county region.

With the above information, ADE was able to estimate net after tax profit ratios for sources affected by the proposed control measures. ADE calculated ratios of profit per dollar of revenue for affected industries. The result of the socioeconomic analysis shows what proportion of profits the compliance costs represent. Based on assumed thresholds of significance, ADE discusses in the report whether the affected sources are likely to reduce jobs as a means of recouping the cost of rule compliance or as a result of reducing business operations. To the extent that such job losses appear likely, the indirect multiplier effects of the jobs losses are estimated using a regional IMPLAN input-output model. In some instances, particularly where consumers are the ultimately end-users of goods and services subject to proposed control measures, we also analyzed to see if costs could be passed to households in the region.

When analyzing the socioeconomic impacts of proposed new rules and amendments, ADE attempts to work closely within the parameters of accepted methodologies discussed in a 1995 California Air Resources Board report called "Development of a Methodology to Assess the Economic Impact Required by SB513/AB969" (by Peter Berck, PhD, UC Berkeley Department of Agricultural and Resources Economics, Contract No. 93-314, August, 1995). The author of this report reviewed a methodology to assess the impact that California Environmental Protection Agency proposed regulations would have on the ability of California businesses to compete. The California Air Resources Board (ARB) has incorporated the methodologies described in this report in its own assessment of socioeconomic impacts of rules generated by ARB. One methodology relates to determining a level above or below which a rule and its associated costs is deemed to have significant impacts. When analyzing the degree to which its rules are significant or insignificant, ARB employs a threshold of significance that ADE follows. Berck reviewed the threshold in his analysis and wrote, "The Air Resources Board's (ARB) use of a 10 percent change in [Return on Equity] ROE (i.e. a change in ROE from 10 percent to a ROE of 9 percent) as a

threshold for a finding of no significant, adverse impact on either competitiveness or jobs seems reasonable or even conservative.”

SECTION FOUR: REGIONAL DEMOGRAPHIC AND ECONOMIC TRENDS

This section of the report tracks economic and demographic contexts within which District staff and officials are contemplating changes to Rule 2-5 and the HRSA guidelines. Table 1 tracks population growth in the nine-county San Francisco Bay Area between 2000 and 2008, including data for the year 2004. Between 2000 and 2004, the region grew by less than one percent a year, at 0.73 percent. Between 2004 and 2008, the region grew annually by slightly over one percent, at 1.05 percent a year. In both periods, the region did not grow as fast as the rest of California. Overall, there are 7,375,678 people in the region. At 1,857,621, Santa Clara County has the most people, while Napa has the least, at 137,571.

TABLE 1
REGIONAL DEMOGRAPHIC TRENDS: 2000-2008
POPULATION GROWTH: SAN FRANCISCO BAY AREA

	Population			Percent Change		
	2000	2004	2008	00-04	04-08	00-08
California	34,430,970	36,676,931	38,292,687	1.6%	1.1%	1.3%
Bay Area	6,871,151	7,073,168	7,375,678	0.7%	1.1%	0.9%
Alameda County	1,465,144	1,498,967	1,556,657	0.6%	1.0%	0.8%
Contra Costa County	966,095	1,016,407	1,060,435	1.3%	1.1%	1.2%
Marin County	248,879	251,586	258,618	0.3%	0.7%	0.5%
Napa County	125,975	132,280	137,571	1.2%	1.0%	1.1%
San Francisco County	785,534	806,433	845,559	0.7%	1.2%	0.9%
San Mateo County	712,289	720,042	745,858	0.3%	0.9%	0.6%
Santa Clara County	1,701,385	1,753,041	1,857,621	0.8%	1.5%	1.1%
Solano County	401,367	418,876	426,729	1.1%	0.5%	0.8%
Sonoma County	464,483	475,536	486,630	0.6%	0.6%	0.6%

Source: Applied Development Economics, based on total population estimates from The California Department of Finance (E-5 Report)

Data in Table 2 describe the larger economic context within which officials are contemplating the proposed updates to the Rule 2-5 and HRSA guidelines. Businesses in the region employ over three million workers, or 3,148,847. The number of jobs in the region grew annually by 1.2 percent between 2004 and 2008, after having declined dramatically between 2000 and 2004 by 2.7 percent a year. Of the 3,148,847 positions, almost 13.4 percent are in the public sector. In the state, almost 15 percent of all jobs are in the public sector. Relative to the state as a whole, manufacturing, professional/business services, and education/health service sectors comprise a greater proportion of the employment base. In the region, these sectors comprise 0.2 percent, 18 percent, and 11.4 percent respectively of total employment. In the state, these sectors comprise 9.1 percent, 14.4 percent, and 10.8 percent of statewide job base. In other words, as a percent of total workforce, the region employs more people in sectors and industries that are presumptively more advanced,

higher-paying.

TABLE 2
REGIONAL EMPLOYMENT TRENDS: 2000-2008

	2000	2004	2008	Distribution 2008 SFBA	Distribution 2008 State	Annual Percentage Change 00-04	Annual Percentage Change 04-08
Private and Public: All	3,353,821	3,003,430	3,148,847			-2.70%	1.20%
Total, all industries (private ownership):	2,939,710	2,588,823	2,727,987			-3.10%	1.30%
Goods-Producing	**650,274**	**515,647**	**503,436**			**-5.60%**	**-0.60%**
Natural Resources and Mining	22,267	17,599	16,120	0.50%	2.70%	-5.70%	-2.20%
Construction	173,663	169,409	165,536	5.30%	5.00%	-0.60%	-0.60%
Manufacturing	454,346	328,642	321,780	10.20%	9.10%	-7.80%	-0.50%
Service-Providing	**2,289,437**	**2,073,174**	**2,224,553**			**-2.50%**	**1.80%**
Trade, Transportation, and Utilities	582,710	521,223	526,559	16.70%	18.30%	-2.70%	0.30%
Information	147,606	110,639	112,028	3.60%	3.00%	-7.00%	0.30%
Financial Activities	190,053	197,996	186,333	5.90%	5.50%	1.00%	-1.50%
Professional and Business Services	661,810	502,453	567,658	18.00%	14.40%	-6.70%	3.10%
Education and Health Services	304,028	323,039	358,359	11.40%	10.80%	1.50%	2.60%
Leisure and Hospitality	282,104	284,461	314,110	10.00%	10.10%	0.20%	2.50%
Other Services	120,900	133,027	148,383	4.70%	4.80%	2.40%	2.80%
Unclassified	0	338	11,123	0.40%	0.50%		
Government Ownership:							
Federal Government	62,225	52,493	49,969	1.60%	1.60%	-4.20%	-1.20%
State Government	74,725	81,082	82,135	2.60%	3.00%	2.10%	0.30%
Local Government	277,161	281,032	288,756	9.20%	11.30%	0.30%	0.70%

Source: ADE, Inc. based on EDD LMID

SECTION FIVE: SOCIOECONOMIC IMPACT ANALYSIS

This section of the report analyzes socioeconomic impacts stemming from changes to the Rule 2-5 and HRSA guidelines to clarify procedures, amend health effects factors, or incorporate other revisions to regulatory guidelines. In particular, the District is contemplating a proposal to incorporate age sensitivity factors in the health risk assessment procedures. As indicated earlier, changes that the BAAQMD is considering would result in a 70 percent increase in cancer risk estimates for residential receptors. This section analyzes impacts on the three most common source categories in the six priority communities: diesel-fired emergency generator engines, gasoline dispending facilities (GDFs), and crematories.

In identifying the common source categories identified below, the District analyzed its databases and identified a number of specific sources that will be subject to the rule changes. Below is a summary of how sources were identified for purposes of the socioeconomic impact analysis.

Diesel Fired Emergency Generator Engines

The District estimates that 12 percent of diesel engines in operation in the region need to comply with current rules. Thus, of the 312 engines subject to the rule as currently written, 37 projects are expected to require cleaner engines or diesel PM filters. When age sensitivity factors are included (the current Rule 2-5 proposal), the total number of projects requiring cleaner engines or diesel PM filters will be 69, or 312 times 22 percent. Therefore, this rule change is expected to require an additional 32 diesel engine projects per year (69-37) to have cleaner engines or diesel PM controls. About 40 percent of the engine projects affected by the rule change were for engines <750 bhp (32*0.4 = 13 engine projects). About 60 percent of the engine projects affected by the rule change were for larger engines: 32*0.6 = 19 projects for engines>750 bhp. The average size of the larger engine projects affected by the rule change was 1714 bhp.

Assuming the diesel PM filter costs are roughly proportional to engine size, the average diesel PM filter cost for the 13 smaller engine projects would be about $20,000 per engine and the average diesel PM filter cost for the 19 larger engine projects would be about $65,000 per engine. When annualized, the $20,000 and $65,000 costs translate into $2,460 and $7,995 per year.

Crematories

The District reviewed 19 health risk assessments for crematories in the Bay Area spanning a 5 year period for an average of 4 crematory HRSAs per year. The cancer risks for these projects ranged from 0.6 in a million to 10.0 in a million for most sites. One site had a cancer risk of 90 in a million. After incorporating the age dependent adjustment factors for

residential cancer risk, 8 of the 19 sites evaluated (42 percent) would have cancer risks exceeding 10 in a million risk.

About half of the crematories could likely comply with the 10 in a million risk limit by limiting their operation or increasing stack heights. The other facilities would likely require some type of add-on emissions control to achieve compliance. One site would have a cancer risk greater than 100 in a million and would become subject to mandatory risk reduction measures under AB-2588.

The District is considering adopting risk reduction measures for crematories that would result in lower metal emissions. A 40 percent reduction in risk weighted emissions would allow all but one facility to meet a 10 in a million cancer risk. The anticipated control measures, which include carbon injection and dry filtration, are expected to achieve greater than 40 percent reduction in cancer risk weighted emissions. The District is investigating the cost of these potential control measures.

Costs stemming from the add-on emission control could run up to $1.2 million for three crematory retorts with two abatement systems, based on discussions between District staff and one potentially affected crematory. On average, the $1.2 million for three crematory retorts amounts to $400,000 per crematory retort, which, when annualized, translates to a $49,900 annual cost.

Gasoline-Dispensing Facilities (GDFs)

As with the diesel engines, the percentages of affected projects need to be applied to the expected number of risk screens. In this case, the District expects about four percent of the anticipated 400 risk screens/year to involve GDFs: (400*0.04 = 16 GDF risk screen projects per year). After incorporation of enhanced vapor recovery (EVR) and age-sensitivity factor adjustments, about 75 percent of the GDFs would not be allowed to have any additional emission increases. However, the District staff indicates that it might only get applications for new GDFs or for throughput increases from the remaining 25 percent of the GDF sites that could accommodate a throughput increase. Since EVR is the best control available and all retail GDFs should have EVR in place by now, there are no additional control options. For the 16 GDF risk screens/year, the District anticipates that the majority will involve new facilities with a few modifications at existing GDFs. For new facilities, the throughput rate that would be allowed for a new GDF equipped with EVR is higher than the throughput rate that would have been allowed under the current procedures for a GDF without EVR. Thus, CARB's EVR requirement will offset the impacts of the proposed risk screen procedure change. For existing facilities, the District would either approve the permit request for a throughput increase (though the throughput amount allowed may not be as high as the site wants), or the District would deny the requested increase for an existing GDF, if the site already has a throughput limit that is higher than the District could now allow.

SOCIOECONOMIC IMPACT ANALYSIS AND SMALL BUSINESS DISPROPORTIONATE ANALYSIS

Table 4 includes the number of sources in the nine-county region operating diesel engines that will be subject to the proposed changes to HRSA guidelines. As the table below shows, there are 51 establishments in the region that will be impacted by the proposed changes. The diesel engines are placed in commercial offices, retail centers (Target, Costco, etc) cell phone tower locations (many for Verizon), and in institutional settings such as hospitals and educational facilities. In essence, any kind of business that needs back-up power typically operates diesel engines and would be subject to changes to the HRSA guidelines when the site proposes to install, replace, or modify a diesel engine.

Of the 51 affected establishments, 23 are in office/business park settings. Typically, businesses here are high-tech businesses, including bio-engineering, software engineering, computer electronics manufacturers, and computer-peripheral equipment designers and manufacturers. Among the 23 affected sources is Apple, Inc., which alone generates $19.3 billion of the $22.4 billion in annual revenues generated by affected sources. As the table below shows, costs stemming from the rule change are less than significant across the board.

TABLE 4
SOCIOECONOMIC ANALYSIS: PROPOSED CHANGES TO RULE 2-5 AND HRSA GUIDELINES: IMPACTS ON SOURCE CATEGORIES WITH DIESEL ENGINES

	Estab.	Revenues	Net Profits	Annual Costs	Costs to Net Profits	Summary
Total	**51**	**$29,489,515,514**	**$3,154,924,086**	**$186,290**	**0.006%**	**less than significant**
Office	23	$22,360,245,062	$1,269,123,120	$100,820	0.008%	less than significant
Industrial	3	$367,028,700	$367,028,700	$12,910	0.004%	less than significant
Refinery	1	$5,474,627,540	$310,675,487	$7,990	0.003%	less than significant
Institutional: civic	2	$72,100,000	$72,100,000	$4,920	0.007%	less than significant
Institutional: education	2	$61,914,497	$61,914,497	$4,920	0.008%	less than significant
Institutional: cultural	1	$6,800,000	$6,800,000	$2,460	0.036%	less than significant
Institutional: Hospital	2	$1,022,752,004	$1,022,752,004	$4,920	0.000%	less than significant
Institutional: residential	1	$12,100,000	$378,172	$2,460	0.650%	less than significant
Institutional: Hotel/Motel	1	$4,500,000	$285,896	$2,460	0.860%	less than significant
Institutional: Other	1	$13,569,789	$13,569,789	$7,990	0.059%	less than significant
Cell phone tower	8	$9,653,499	$530,482	$19,680	3.710%	less than significant
Retail center	2	$29,441,980	$27,515,581	$4,920	0.018%	less than significant
Unknown	4	$54,782,443	$2,250,359	$9,840	0.437%	less than significant

Source: ADE, Inc., based on BAAQMD, GoogleEarth, US Economic Census 2002, US Bureau of Labor Statistics, and various corporate annual reports

There are approximately 64 crematories operating in the nine-county Bay Area. Of these facilities, the District expects eight will be impacted by changes to the HRSA guidelines. The analysis assumes that impacted sources represent larger facilities relative to the rest of the crematories in the Bay Area, in terms of number of workers and operating capacity. The analysis applies revenue-per-worker ratios derived from the US Economic Census 2002 in a way that accounts for the size of the eight sources affected by the proposed rule changes.

As Table 5 below shows, the eight establishments generate an estimated $59.9 million in annual revenues, out of which is generated $5.4 million in net profits. Annual costs stemming from the project amount to $399,200, for a cost-to-net profit impact of 7.4 percent, which is below the 10 percent threshold used for determining whether impacts stemming from a rule are significant.

TABLE 5
SOCIOECONOMIC IMPACT ANALYSIS: PROPOSED CHANGES TO RULE 2-5 AND HRSA GUIDELINES: CREMATORIES SOURCE CATEGORY

NAICS Code	812220
Description	Cemeteries and crematories
Affected Sources	8
Employment	606
Est. Annual Revenues	$59,905,684
Est. Annual Profits	$5,391,512
Est. Annual Cost	$399,200
Cost-to-Net Profits	7.4%
Summary	< significant

Source: ADE, Inc., based on BAAQMD, US Economic Census 2002, and US BLS

Proposed changes to Rule 2-5 and HRSA guidelines affect GDFs unlike the way crematories or sources with diesel engines are impacted. Rather than requiring a new emission-control equipment, GDF sources impacted by the proposed rule are either prevented from expanding capacity, or are allowed to expand capacity by a certain amount specified by the District per existing Rule 2-5 and HRSA guidelines.

There are a total of 2,588 GDFs in the District. About 1,640 of these GDFs are retail facilities (i.e. gasoline service stations) and the remainder are non-retail facilities serving fleets, company vehicles, etc. Although the District processed over 1,000 permit applications for equipment changes at GDFs in 2008, most of these changes involved EVR upgrades that resulted in emission reductions and did not trigger new risk screens. In 2008, only 14 risk screens (out of 399 total risk screens for all source types) involved new or modified GDFs that were subject to Regulation 2, Rule 5. The non-retail GDFs generally have much lower throughputs than the retail GDFs and are typically not located close to residents. Therefore, non-retail GDFs will not be impacted by the rule change, according to the District.

As required by CARB, all retail GDF sites should now be equipped with EVR. For sites with EVR, no additional emission control measures are possible. The only way the District can reduce risk at these sites is to limit the gasoline throughput. If a GDF site has a current throughput limit that would result in a risk > 10 in a million under the new Rule 2-5 proposal, the site would not be forced to accept a lower throughput limit, but the District would deny any increase in their current throughput limit. The only practical method that retail GDFs have of complying with a throughput limit is to raise their prices when their actual throughput rate is approaching their limit (if they can't get a throughput limit increase from the District due to 2-5 limitations). In such cases, customers will generally shift their business to another station, which may be farther away, resulting in additional costs and driving emissions.

Data in Table 5 analyzes impacts on 100 GDFs. The District provided the consultant with baseline data on the 100 GDFs, such as name of the facility, location by address, throughput

capacity, and additional capacity that sources can grow by (if at all), among other things. The consultant combined the District's data with sales 2004-2007 data from the California Board of Equalization for the nine-county Bay Area region, to estimate amount of sales generated by each of the 100 GDFs in the dataset provided by the District. While the socioeconomic analysis is conducted on 100 GDFs, in a typical year, the District typically conducts HRSAs for less than 20 GDF projects per year.

In analyzing its own databases, the District anticipates that it will not allow 74 to 75 percent of the GDFs to increase capacity and allow the remaining 25 to 26 percent to increase capacity, in the event the proposed rule change is adopted. Data in the table below shows that, of the 74 sample GDFs sample *not allowed* to increase throughput, 15 are generating average revenues above the regional average, or 20 percent of those not allowed to increase throughput. Similarly, of the 74 sample GDFs *not allowed* to increase throughput, 59 generate average revenues below the regional average, or 80 percent of those not allowed to increase throughput

TABLE 6
SOCIOECONOMIC IMPACT ANALYSIS: PROPOSED CHANGES TO RULE 2-5 & HRSA GUIDELINES: GASOLINE-DISPENSING FACILITIES SOURCE CATEGORY

	Sample: 100 GDFs	Aggregate Revenues	Average Revenues	Aggregate Net Profits	Avg. Net Profits	Est. Annual Aggregate Volume of Gas Sold (gallons)	Est. Annual Average Volume of Gas Sold Per Station (gallons)
Total Number of GDFs in 100 Sample	100	$426,566,662	**$4,265,667**	$4,333,313	$43,333	104,042,527	1,040,425
Sample GDFs Allowed to Increase	26	$196,623,448	$7,562,440	$1,997,416	$76,824	47,957,804	1,844,531
Sample GDFs Not Allowed to Increase	74	$229,943,214	$3,107,341	$2,335,897	$31,566	56,084,723	757,902
Sample GDFs Allowed to Increase	26	$196,623,448	$7,562,440	$1,997,416	$76,824	47,957,804	1,844,531
Number GDFs generating > Avg Revenues	17	$176,187,507	$10,363,971	$1,789,816	$105,283	42,973,338	2,527,843
Number GDFs generating < Avg Revenues	9	$20,435,942	$2,270,660	$207,600	$23,067	4,984,466	553,830
Sample GDFs **Not Allowed** to Increase	74	$229,943,214	$3,107,341	$2,335,897	$31,566	56,084,723	757,902
Number GDFs generating > Avg Revenues	15	$97,908,082	$6,527,205	$994,607	$66,307	23,880,451	1,592,030
Number GDFs generating < Avg Revenues	59	$132,035,132	$2,237,884	$1,341,290	$22,734	32,204,272	545,835

Source: ADE, Inc. based on BAAQMD, California Board of Equalization, US Department of Energy

The District indicates that it believes that GDFs interested in increasing throughput more than likely will come from 26 sample GDFs that are allowed to increase throughput, or 25 percent to -26 percent of total sample GDFs. Of the 26 sample GDFs allowed to expand throughput, 17 (65 percent of sample GDFs allowed to expand) generate average revenues well-above the regional average, i.e. $10.4 million versus $4.3 million (rounded). Of the 26 sample GDFs allowed to expand throughput, nine (35 percent of sample GDFs allowed to expand) generate average revenues below the regional average, i.e. $2.3 million versus $4.3 million (rounded).

Based on the numbers and percentages generated via the table above, it is possible that the 16 GDFs that receive risk screens a year will break down accordingly:

- If all 16 GDFs are within the group that's allowed to increase, then 10 (or 65 percent) will generate revenues and net profits above the regional average - assuming percentages derived from above hold
- If all 16 GDFs are within the group that's allowed to increase, then 6 (or 35 percent) will operate on razor thin profit margins, on average $23,100, which is almost 5 times below amount generated by the other 10 GDFs allowed to increase.

It is also possible that the 16 GDFs allowed to expand break down according to the sample as a whole:

- If all 16 GDFs are distributed in accordance with way 100 sample GDFs are distributed, then 12 of the 16 could *not be allowed* to increase throughput ($12 = .74_{\text{no expand ratio}} * 16$), leaving only four remaining that would be allowed to increase ($4 = 16 – 12$).
- In the scenario where all 16 GDFs are distributed in accordance with the way 100 sample GDFs are distributed, four are allowed to increase their respective throughput, and, if the percentages hold, of the four, three will generate better than average revenues ($3 = 4 X [17/26]$) and one will be low-performing ($1 = 4 X [9/26]$)

Socioeconomic impact of the proposed rule change on GDFs is such that retail GDFs that are *not allowed* to increase throughput and, at the same time, are *low-performing* relative to the regional average revenue benchmark will continue to be low-performing: the rule precludes these businesses from expanding via additional throughput, thus leaving these businesses to compete on price. But in this regard, the businesses cannot (for the most part) increase prices to off-set static volume due to competition. Will these businesses shutter because the program precludes them from expanding? Judging from a review of each of the 59 GDFs *not allowed* to increase capacity that are also low-performing, it appears that the gap between each businesses' respective revenues and the regional revenue average is such that they would need to expand throughput capacity in a significant manner that, in all likelihood, would not realistically occur given space limitations at the affected sites. Of the 59 GDFs that are *not allowed* to increase capacity and are *low-performing*, approximately three are within striking range of the regional revenue average through throughput expansion. Most likely, these are the only gas stations that could expand. The remaining 56 *low-performing* entities *not allowed* to

expand will continue to be low-performing; it is not a forgone conclusion that these stations will shutter, as a number of these stores may have developed a niche. In the event the stations shutter, it would not be because of the proposed changes to Rule 2-5 and the HRSA guidelines, as many were low-performing to begin with, with limited physical expansion potential.

It is important to note that some of the 16 GDFs that the District *allows* to expand will also be *low-performing* -- if the percentages indicated in the District's GDF dataset hold. Based on a close examination of its database, the District determined that of the GDFs in its sample of 100, 25 to 26 percent could expand capacity. We examined the data further and estimate that, of the 26 that could expand, nine are low-performing in terms of revenues, or 35 percent of the GDFs allowed to expand (i.e. 26). The nine low-performing GDFs allowed to expand also represent nine-percent of the total number of GDFs that are either allowed to expand and are prevented from expanding. Thus, the rule does not preclude relatively low-performing businesses from growing.

SMALL BUSINESS DISPROPORTIONATE IMPACT ANALYSIS

As discussed above, businesses impacted subject to proposed changes to Rule 2-5 and the HRSA guidelines are not impacted significantly across the board. For these reasons, we conclude that small businesses are not disproportionately impacted.

APPENDIX A: SUMMARY OF DISTRICT RISK SCREEN DATA (BAAQMD)

In 2008, the District conducted 399 health risk screening analyses (HRSAs) on new or modified sources. The projects evaluated included new or modified diesel engines (78 percent), gasoline dispensing facilities (4 percent), and a variety of other commercial and industrial sources, such as gas fired combustion devices, crematories, petroleum refinery projects, cement plants, and landfills.

The District's proposal to incorporate age sensitivity factors in the health risk assessment procedures will result in a 70 percent increase in the cancer risk estimates for residential receptors. The District has reviewed recent risk assessment data for the three most common source categories to determine how this proposed risk calculation procedure change may impact future projects.

Diesel-Fired Emergency Generator Engines

The District reviewed 50 risk screens that were conducted in 2009 for new diesel-fired emergency standby engines. For these risk screens, 46 projects (92 percent) included a single IC engine and 4 projects (8 percent) included multiple engines at a site. The diesel engine sizes ranged from 48 bhp to 3251 bhp, and the average engine size was 739 bhp. Project cancer risks for these projects ranged from 0.1 in a million to 9.9 in a million, and the average cancer risk for these 50 projects was 4.4 in a million. The ranges of engine sizes evaluated and the average cancer risk for each size range are presented in Table 1.

TABLE 1
DIESEL ENGINE SIZES EVALUATED IN 2009

Emergency Standby Engine Capacities	Percentage of Engines for 2009 Data Set	Average Project Cancer Risk in a Million
< 250 bhp	41%	3.2
250 bhp < 750 bhp	29%	5.2
750 bhp and larger	29%	5.6

Source: ADE, Inc.

The data recorded for these projects did not specify whether the maximum risk for the project occurred at a residential or a worker receptor. The proposed change to include age sensitivity factors in the health risk calculation procedures will only impact the cancer risk determination for residential receptors. For the purposes of this analysis, the District assumed that the proposed 70 percent increase in residential cancer risk estimates applies to all the projects in the 2009 data set.

After including the age-dependent factors in the risk screen procedure, 40 percent of the projects would have cancer risk greater than the project risk limit of 10 in a million risk.

If a diesel-fired engine project exceeds a project risk standard, the District will present various compliance options to the applicant. For emergency generators, the most commonly used compliance option is to reduce the maximum allowable annual operating time for reliability related activities. The CARB ATCM allows 50 hours/year of operation for reliability related testing, but many standby engine operators do not require this many hours and can accept a lower operating time limit. This compliance option adds no cost to the project.

Other compliance options include using a different engine with a lower certified emission diesel PM emission rate (grams/bhp-hour) or adding a diesel particulate filter to the proposed engine that reduces the certified diesel PM emission rate from the proposed engine. While there is presumably an added cost for using a cleaner engine and will certainly be an additional cost for using a diesel PM filter, these options have the added benefit of reducing emissions from the engine while it is operating during an emergency. Diesel particulate filter costs range from $12,000 for small mobile sources to $118,000 per filter for a facility with sixteen large standby engines (3353 bhp each).

Most of the projects that would have an age sensitivity factor adjusted cancer risk of more than 10 in a million should be able to achieve compliance with the Regulation 2, Rule 5 project risk limit of 10 in a million cancer risk by limiting the annual operating time for reliability related activities. Assuming that all engine operators could accept an operating time as low as 30 hours/year, only 6 additional projects (12 percent of the total projects reviewed) would need to use a cleaner engine or diesel particulate filter to achieve compliance.

CARB and EPA have adopted tier standard changes that will reduce PM emissions from new diesel engines in the near future. To compare the impacts of these tier standard changes, the District used the 2009 risk screen set discussed above to develop a baseline group of engines. The 2009 baseline group includes the engine sizes evaluated for the risk screen set, the 2009 maximum allowable engine diesel PM emission rate for the engine (this limit is the current TBACT and ATCM standard of 0.15 g/bhp-hour), and either the ATCM maximum allowable operating time of 50 hours/year. For this 2009 baseline set of engines, 22 percent of the projects exceeded the project risk limit of 10 in a million and required some type of diesel PM emission limitation. About half of these projects could achieve compliance by adjusting the annual operating time limitation, but 12 percent of the total projects reviewed would require a cleaner engine or a diesel PM filter.

For engines subject to the 2009 and 2010 emission standards, including the age dependent factors in the calculation procedures will increase the number of projects that are required to implement controls to 44 percent compared to the baseline rate of 22 percent. As with the baseline case, about half of these projects are expected to be able to comply with the 10 in a million project risk standard by using the no-cost compliance option of reducing their operating time limit for reliability related activities. However, 22 percent of the total projects (compared to 6 percent for the baseline case) would require a cleaner engine or diesel PM filter.

As of 2011, all diesel engines larger than 175 bhp will be subject to interim Tier 4 diesel PM standards that are lower than the current TBACT/ATCM limit of 0.15 g/bhp-hr. These changes will reduce the number of diesel engine projects that will require emission controls in order to comply with the Regulation 2, Rule 5 project risk limit. By 2011, only 8 percent of the projects, based on inclusion of the age-adjustment factors in the calculation procedures, will require emission controls, and only 4 percent of the projects will require cleaner engines or diesel PM filters to achieve compliance. These percentages are lower than the percentages of projects requiring emission limits and diesel PM filters for the 2009 baseline set. By 2013, all projects are expected to comply with the project risk limits without any additional diesel PM reductions.

Gasoline Dispensing Facilities

The District evaluated 100 risk screens for gasoline dispensing facilities (GDFs) that were conducted during 2004-2009. At the time these risk screens were conducted, many of the GDFs were not equipped with enhanced vapor recovery (EVR) on the gasoline dispensing operations, which is now required for all retail GDFs. Without Phase II EVR, 19 percent of the GDFs were found to have actual cancer risks greater than 10 in a million based on actual throughput data for the site. After adjusting the emission rates downward for sites that should now have Phase II EVR implemented, only 2 percent of the sites would have cancer risks exceeding 10 in a million. If the 70 percent increase in residential cancer risk, which is caused by the incorporation of the age sensitivity factors in the District's risk calculation procedure, is applied to the post-EVR actual risk data, then 22 percent of the GDFs are expected to exceed a cancer risk of 10 in a million. These facilities (22 percent of the retail GDFs) would not be allowed to have any additional throughput increases and would be subject to the AB-2588 public notification requirements.

After adjusting for post Phase II EVR emission reductions, 76 percent of the GDFs have condition limits that result in cancer risks of less than 10 in a million, and 65 percent of the GDFs could be allowed a throughput increase of 10 percent or more above the current limit for that site. However, when the age sensitivity factors are incorporated into the risk calculations, the percentage of GDFs with condition limits equating to less than 10 in a million cancer risk is reduced to 25 percent. Only 9 percent of the GDF sites would be allowed to have a throughput increase of 10 percent or more.

After including the age sensitivity adjustment factors in the risk calculation procedure, the gasoline throughput limit for a new facility could be no higher than 113,860 gallons/year based on the best case site conditions and meteorological data reviewed in the study. However, the throughput limit for a new facility could be as low as 760 gallons/year for a site located close to residents that has no applicable real meteorological data. The actual throughput rates for the GDFs evaluated in this study ranged from 9 gallons/year to 12,380 gallons/year with an average of 2,195 gallons/year. While all sites could comply with the best case throughput limit for a new GDF, only 6 percent of the stations could meet the worst case throughput limit.

If the age sensitivity factors are incorporated into the risk calculation procedures, the receptor types and locations near a site and the available meteorological data for a site will have a large impact on a new GDF's ability to comply with the Regulation 2, Rule 5 project risk limit. The District may need to conduct many more refined risk assessments and reevaluate the use of SCREEN3 meteorological data for GDFs.

Crematories

The District reviewed 19 health risk assessments for crematories in the Bay Area, spanning a 5 year period for an average of 4 crematory HRSAs per year. The cancer risks for these projects ranged from 0.6 in a million to 10.0 in a million for most sites. One site had a cancer risk of 90 in a million.

After incorporating the age dependent adjustment factors for residential cancer risk, 8 of the 19 sites evaluated (42 percent) would have cancer risks exceeding 10 in a million risk.

About half of the crematories could likely comply with the 10 in a million risk limit by limiting their operation or increasing stack heights. The other facilities would likely require some type of add-on emissions control to achieve compliance. One site would have a cancer risk greater than 100 in a million and would become subject to mandatory risk reduction measures under AB-2588.

The District is considering adopting risk reduction measures for crematories that would result in lower metal emissions. A 40 percent reduction in risk weighted emissions would allow all but one facility to meet a 10 in a million cancer risk. The anticipated control measures, which include carbon injection and dry filtration, are expected to achieve greater than 40 percent reduction in cancer risk weighted emissions. The District is investigating the cost of these potential control measures.