BOARD MEETING DATE: June 5, 2015 AGENDA NO. 28

PROPOSAL: Proposed Amended Rules 1401 – New Source Review of Toxic Air Contaminants, 1401.1 – Requirements for New and Relocated Facilities Near Schools, Rule 1402 – Control of Toxic Air Contaminants from Existing Sources, and 212 – Standards for Approving Permits and Issuing Public Notice

SYNOPSIS: In March 2015, the Office of Environmental Health Hazard Assessment (OEHHA) approved revisions to their Air Toxics Hot Spots Program Risk Assessment Guidelines. Rule 1401 – New Source Review of Toxic Air Contaminants, Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools, and Rule 1402 – Control of Toxic Air Contaminants from Existing Sources currently rely on the prior OEHHA Risk Assessment Guidelines to calculate health risks. Amendments are proposed to reference the Revised OEHHA Guidelines and to amend specific provisions to harmonize with the Revised OEHHA Guidelines. Proposed Amended Rule 1401 may include provisions for specific source categories or situations that cannot meet the Rule 1401 risk thresholds using the Revised OEHHA Guidelines.

COMMITTEE: Stationary Source, April 17, 2015, May 15, 2015, Reviewed

RECOMMENDED ACTIONS:

1. Adopt the attached resolution:
    a. Certifying the Final Environmental Assessment for Proposed Amended Rules to Implement OEHHA Revisions to the Air Toxics Hot Spots Program Risk Assessment Guidelines; and
    b. Amending Rules 1401, 1401.1, 1402, and 212.

2. Receive and file:
   - SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 (Version 8.0)
   - SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act (June 5, 2015);
   - SCAQMD Facility Prioritization Procedures for AB 2588 Program (June 2015).

Barry R. Wallerstein, D.Env.
Executive Officer

PF:JW:SN:EK

Background

The California Office of Environmental Health Hazard Assessment (OEHHA) establishes risk exposure information (i.e., risk values) for toxic air contaminants (TACs). Additionally, AB2588 requires that OEHHA develop health risk assessment guidelines for implementation of the Hot Spots Program (Health and Safety Code Section 44360(b)(2)). In 2003, OEHHA developed and approved the Health Risk Assessment Guidance (2003 OEHHA Guidelines). Since the adoption of the 2003 Guidelines, new scientific information has shown that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. Based on this information, OEHHA approved the Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines) on March 6, 2015. The Revised OEHHA Guidelines incorporate age sensitivity factors which will increase cancer risk estimates to residential and sensitive receptors, based on the change in methodology. Under the Revised OEHHA Guidelines, even though the toxic emissions from a facility have not increased, estimated cancer risk to a residential receptor will increase due to the change in methodology. Cancer risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged.

Proposal

The SCAQMD relies on OEHHA’s health risk assessment guidelines in various aspects of its toxics regulatory program including the permitting program and AB2588 Hot Spots Program. SCAQMD staff is proposing amendments to the following rules affected by the Revised OEHHA Guidelines:

- Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants
- Proposed Amended Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools

- Proposed Amended Rule 1402 – Control of Toxic Air Contaminants from Existing Sources
- Proposed Amended Rule 212 – Standards for Approving Permits and Issuing Public Notice

The proposed amendments will revise definitions and risk assessment procedures to be consistent with the Revised OEHHA Guidelines. Proposed Amended Rule 1401 includes a provision that would allow the following two source categories to use the previous version of the OEHHA Guidelines to allow additional time for staff to analyze these source categories and provide further recommendations for implementation through a proposed rule and/or procedures: (1) spray booths; and (2) retail gasoline stations. The proposed amendments are to ensure SCAQMD staff can implement the Revised OEHHA Guidelines regarding how health risks are calculated. Staff is not recommending revisions to the health risk thresholds in the proposed amended rules. Additionally, staff is updating the following documents to incorporate the Revised OEHHA Guidelines. These documents will be used to implement Rules 1401, 1401.1, 1402, and 212:

- SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 (Version 8.0)
- SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act
- SCAQMD Facility Prioritization Procedures for AB 2588 Program

Public Process

PAR 1401, 1401.1, 1402, and 212 were developed through a public process. As part of the generalized work plan presented at the March 2015 Governing Board meeting, SCAQMD staff began an extensive outreach and communication effort to engage all stakeholders regarding the Revised OEHHA Guidelines and the proposed amended rules. The SCAQMD staff held five regional Public Workshops in March and April of 2015 throughout the Basin, and conducted additional workshops to the following business groups that requested further information on the proposed amended rules and the Revised OEHHA Guidelines: Southern California Alliance of Publicly Owned Treatment Works (SCAP), San Gabriel Valley Legislative Coalition of Chambers, California Small Business Alliance, California Health Care Association, California Council for Environmental and Economic Balance, Western States Petroleum Association (WSPA), and the Chambers of Commerce for the cities of Santa Monica, Riverside, and the City of Industry.

Key Outstanding Issues

Several key issues have been brought to staff’s attention during rule development. The most notable issues and their resolutions are summarized below:

The business community is concerned with risk communication to the public. OEHHA’s latest proposed risk notification guidelines could force local businesses to notify surrounding communities that their estimated health risk has increased – even though their facility emissions have stayed the same or even decreased. It is important that the public realize that air toxics emissions have not increased; rather, the state has changed the way it estimates air toxics risk. Failure to do so will leave the public with the false impression that air emissions have worsened, when the exact opposite is true. SCAQMD staff has worked with industry groups to enhance risk communication in rule-related documents and presentations to clearly explain and discuss health risk estimations and achieved toxic emission reductions to the public. Going forward, SCAQMD staff will develop other risk communication documents in consultation with stakeholders to include in public notifications that result from the implementation of the Revised OEHHA Guidelines.

Through the rule development process, some business representatives have asked for consideration of increasing health risk thresholds. SCAQMD staff believes that Rule 1401 and 1402 thresholds are health protective and is recommending maintaining the existing thresholds. While the risk calculation procedure has been revised, the underlying purpose of minimizing the risk to the public remains the same. Rule 1401 ensures that all new and modified permits issued meet the health protective risk thresholds. Similarly, Rule 1402 addresses existing operations to identify and reduce risk. Increasing the health risk threshold above the existing action risk level of 25 in a million would reduce the number of facilities that would be required to implement risk reductions, however risk reduction would not be required for facilities that are below the higher action risk level. If under Rule 1402, the action risk level was increased from 25 to 30 in a million, the number of facilities affected would be reduced from 22 to 10 facilities with about a 15 percent reduction in implementation costs, and risk reductions from ten facilities would not occur. Staff believes cost issues can best be handled through the Risk Reduction Plan process rather than by raising the health-protective thresholds.

Comments have been received regarding a procedure to allow three years (four years for public facilities) early risk reductions. Under this approach, facilities would commit to reducing their risk to below 10 in one million and not be required to provide public notification. Additionally, the commenters recommend committed facilities should have low-cost, expedited permits. SCAQMD staff has been working with stakeholders to identify potential options to encourage early risk reduction, particularly risk reductions that may not have occurred under the existing regulatory program. However, under AB 2588, some form of public notice must be required, even if a facility commits to early reductions. Different notification strategies that fulfill regulatory requirements and explain the facility's commitment to early, enhanced risk reductions will be explored. However, staff does not agree that permits fees should be discounted as that would merely transfer the cost of risk reduction from the facility creating the risk to other fee-paying facilities.

California Environmental Quality Act

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, SCAQMD staff has evaluated the proposed project and prepared the appropriate CEQA document. The public workshop meetings also served to solicit public input on any potential environmental impacts from the proposed project. Comments received at the public workshops on any environmental impacts were considered when developing the final CEQA document for this rulemaking. The Draft Environmental Assessment (EA) was released for a 30-day public review and comment period beginning on March 20, 2015 and ending on April 22, 2015. No comment letters were received from the public relative to the environmental analysis in the Draft EA.

Since the release of the Draft EA, minor modifications have been made to the document. However, none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the Draft EA pursuant to CEQA Guidelines §15073.5 and §15088.5. Therefore, the Draft EA is now a Final EA and is included as an attachment to this Governing Board package. Prior to making a decision on the adoption of the proposed project, the SCAQMD Governing Board must review and certify the Final EA as providing adequate information on the potential adverse environmental impacts of the proposed project.

Socioeconomic Analysis

Compliance costs have been analyzed for additional pollution control equipment and their permitting costs, submitting or updating HRAs, and the costs of issuing additional public notices. Assuming a 4% real interest rate, the estimated annual cost of compliance is $0.3 million for PAR 1401. The associated annual compliance cost for risk reductions for Rule 1402 is estimated to range from $1.3 million to $1.4 million, depending on the real interest rate assumed (1%-4%). The annualized cost of submitting new or updated HRAs is $0.2 to $0.3 million depending on the assumed interest rate. Issuance of public notifications associated with PAR 1402 is estimated to have an annual cost of $7,500 to $8,800. The estimated total annual cost of compliance with PAR 1402 is therefore $1.5 to $1.7 million assuming a 4% real interest rate. The compliance costs conservatively assume that previously reported health risks and emission inventories apply today, even though they were reported in the previously approved HRAs and may not reflect the most recent status at the AB2588 facilities. Additional facilities were included where the calculated risks were near rule thresholds and emissions have remained stable or have increased. PAR 212 also has additional notification costs estimated to be $17,000 to $51,000 annually. The overall estimated annual cost is approximately $1.9 million for implementation of the Revised OEHHA Guidelines for PAR 1401, 1401.1, 1402, and 212.

AQMP and Legal Mandates
Rule 1401, 1401.1, 1402, and 212 are in part mandated by state and federal requirements. The proposed changes are for consistency with the Revised OEHHA Guidelines for estimating health risk.

Implementation and Resource Impact
Existing SCAQMD resources will be used to implement PAR 1401 et al.

Attachments

A. Summary of Proposal
B. Key Issues and Responses
C. Rule Development Process
D. Key Contacts List
E. Resolution
F1-F4. Proposed Amended Rules 1401, 1401.1, 1402, and 212
G. Staff Report for Proposed Amended Rules 1401, 1401.1., 1402, and 212
H. Final Environmental Analysis
I. Socioeconomic Impact Assessment
J. SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, 1402, and 212 (Version 8.0)
K. SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (June 5, 2015)
L. SCAQMD Facility Prioritization for AB 2588 Program (June 2015)

ATTACHMENT A
SUMMARY OF PROPOSAL

Proposed Amended Rules
1401 – New Source Review of Toxic Air Contaminants
1401.1 – Requirements for New and Relocated Facilities Near Schools
1402 – Control of Toxic Air Contaminants from Existing Sources
212 – Standards for Approving Permits and Issuing Public Notice

Proposed Amended Rule 1401

- Revise definition of Maximum Individual Cancer Risk (MICR) to be consistent with the Revised OEHHA Guidelines
- Add provision to allow spray booths and retail gasoline dispensing facilities to continue using the SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) which is based on the previous OEHHA Guidelines until the Board approves revised regulations and/or procedures for these source categories

Proposed Amended Rule 1401.1

- Revise definition of Cancer Risk to be consistent with the Revised OEHHA Guidelines

Proposed Amended Rule 1402

- Revise definition of MICR to be consistent with the Revised OEHHA Guidelines
- Updates to tables for emission reporting thresholds for specific toxic air contaminants and industries for consistency with calculations and methodologies of the Revised OEHHA Guidelines

Proposed Amended Rule 212

- Revise references to MICR to be consistent with the Revised OEHHA Guidelines

Receive and File Items

- Following support documents updated for consistency with the calculations and methodologies of the Revised OEHHA Guidelines:
  - SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 (ver. 8.0)
  - SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act (June 5, 2015)
  - SCAQMD Facility Prioritization Procedures for AB 2588 Program (June 2015)

ATTACHMENT B
KEY ISSUES AND RESPONSES

Proposed Amended Rules 1401 – New Source Review of Toxic Air Contaminants 1401.1 – Requirements for New and Relocated Facilities Near Schools 1402 – Control of Toxic Air Contaminants from Existing Sources 212 – Standards for Approving Permits and Issuing Public Notice

• Business community concerned with risk communication to the public
  o SCAQMD worked with industry groups to enhance risk communication in rule-related documents and presentations to clearly explain and discuss health risk estimations and achieved toxic emission reductions to the public
  o Going forward, SCAQMD staff will develop other risk communication documents in consultation with stakeholders to include in public notifications that result from the implementation of the Revised OEHHA Guidelines
• Some business representatives asking for consideration to increase health risk thresholds
  o SCAQMD staff believes that Rule 1401 and 1402 thresholds are health protective and is recommending maintaining the existing thresholds
  o Increasing health risk thresholds will require less facilities to reduce health risks and will lower implementation costs, however, risk reductions will not occur from those facilities below an increased action risk level
  o If the action risk threshold is increased from 25 to 30 in a million, the number of facilities that would be affected is reduced from 22 to 10 facilities with an estimated cost reduction of 15%. However, 10 facilities would not be required to reduce their health risk
• SCAP and WSPA are requesting for additional time to make risk reductions
  o SCAQMD staff is supportive of incentives for early and additional risk reductions
  o Resolution includes a commitment to continue working with stakeholders to incentivize early and additional risk reductions and assess current public notification procedures and explore alternatives for such facilities, if necessary

ATTACHMENT C

RULE DEVELOPMENT PROCESS

PAR 1401 – New Source Review of Toxic Air Contaminants
PAR 1401.1 – Requirements for New and Relocated Facilities Near Schools
PAR 1402 – Control of Toxic Air Contaminants from Existing Sources
PAR 212 – Standards for Approving Permits and Issuing Public Notice

Potential Impacts of New OEHHA Risk Guidelines on SCAQMD Programs Presented at Special Governing Board Meeting: May 2014

↓

Initial Rule Development: December 2014

↓

Work Plan for Implementing Revised OEHHA Guidelines Presented to Governing Board: March 6, 2015

↓

75-Day Public Notice: March 23, 2015

↓

Public Workshops (5)
San Bernardino County: March 31, 2015
Riverside County: March 31, 2015
SCAQMD Headquarters: April 1, 2015
Orange County: April 2, 2015
Los Angeles County: April 2, 2015

↓

Set Hearing (60-day): April 3, 2015

↓

Industry Group Meetings
San Gabriel Valley Legislative Coalition of Chambers: March 11, 2015
California Small Business Alliance, March 18, 2015
California Health Care Association: March 18, 2015
SCAP: March 24, 2015
WSPA: April 6, 2015
City of Industry Chambers of Commerce (COC): April 6, 2015
Greater Riverside COC: April 9, 2015
Santa Monica COC: April 12, 2015
CCEEB: April 30, 2015
San Diego AWMA: May 19, 2015

↓

Stationary Source Committee Briefing: April 17, 2015 and May 15, 2015
Environmental Justice Advisory Group: April 24, 2015
Home Rule Advisory Group: May 20, 2015

↓

Public Hearing: June 5, 2015

Seven (7) months spent in rule development.
Five (5) Public Workshops.
Ten (10) Industry Group Meetings.

ATTACHMENT D
KEY CONTACTS LIST

Big Bear Chamber of Commerce

Brea Chamber of Commerce

California Air Resources Board

California Chamber of Commerce

California Construction & Industrial Materials Association

California Council for Environmental and Economic Balance

California Health Care Association

California Hospital Association

California Small Business Alliance

California Society for Healthcare Engineering, Inc.

Cathedral City Chamber of Commerce

Cerritos Chamber of Commerce

City of Industry Chamber of Commerce

Coastal Energy Alliance

Culver City Chamber of Commerce

Fullerton Chamber of Commerce

Gateway Chambers Alliance

Greater Riverside Chambers of Commerce

Indio Chamber of Commerce

Industry Manufacturers Council

Inland Empire Economic Partnership

Irvine Chamber of Commerce

Los Angeles Area Chamber of Commerce

Los Angeles County Business Federation (BizFed)

Malibu Chamber of Commerce

NAIOP Commercial Real Estate Development Association SoCal Chapter

Office of Environmental Health Hazard Assessment

Ontario Chamber of Commerce

Pasadena Chamber of Commerce

San Gabriel Valley Economic Partnership

San Gabriel Valley Legislative Coalition of Chambers

Southern California Alliance of Publicly Owed Treatment Works

Southern California Air Quality Alliance

Southwest California Legislative Council

Southwest Riverside County Association of Realtors

Torrance Area Chamber of Commerce

Valley Industry & Commerce Association

Wilmington Chamber of Commerce

Western States Petroleum Association

ATTACHMENT E

RESOLUTION NO. 15-_____

A Resolution of the Governing Board of the South Coast Air Quality Management District (SCAQMD) to certify the Final Environmental Assessment (EA) for Proposed Amended Rules 1401, 1401.1, 1402, and 212 (PAR 1401 et al.).

A Resolution of the SCAQMD Governing Board to Adopt Proposed Amended Rule (PAR) 1401 – New Source Review of Toxic Air Contaminants, PAR 1401.1 – Requirements for New and Relocated Facilities Near Schools, PAR 1402 – Control of Toxic Air Contaminants from Existing Sources, and PAR 212 – Standards for Approving Permits and Issuing Public Notice.

WHEREAS, the SCAQMD Governing Board has determined with certainty that PAR 1401 et al. is a "project" pursuant to the California Environmental Quality Act (CEQA); and

WHEREAS, the SCAQMD staff prepared a Draft EA pursuant to its certified regulatory program and CEQA Guidelines §15251 and §15252, setting forth the potential environmental consequences of PAR 1401 et al.; and

WHEREAS, the Draft EA determined the proposed project would result in no significant adverse environmental impacts; and

WHEREAS, the Draft EA was circulated for 30-day public review and comment period, and there were no public comments, and the Draft EA has been revised such that it is now a Final EA; and

WHEREAS, it is necessary that the adequacy of the Final EA including any responses to comments be determined by the SCAQMD Governing Board prior to its certification; and

WHEREAS, the Final EA reflects the independent judgment of the SCAQMD; and

WHEREAS, the Governing Board prior to voting on PAR 1401 et al., has reviewed and considered the Final EA; and

WHEREAS, the California Office of Environmental Health Hazard Assessment (OEHHA) establishes risk exposure information for toxic air contaminants and develops health risk assessment guidelines for implementation of the Hot Spots Program (Health and Safety Code Section 44360(b)(2)); and

WHEREAS, the SCAQMD uses risk exposure information for toxic air contaminants and health risk assessment guidelines from OEHHA to implement various aspects of its toxics regulatory program; and

WHEREAS, on March 6, 2015, OEHHA approved the Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines) based on new scientific information showing early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood; and

WHEREAS, the SCAQMD staff evaluated permits received between October 1, 2009 and October 1, 2014 and found that some spray booths may have difficulties meeting the Rule 1401 risk thresholds using the Revised OEHHA Guidelines. Because of the large number of permits issued and consideration that this particular source category tends to be associated with smaller businesses such as wood coating operations and autobody facilities, SCAQMD staff is recommending that spray booths continue to use SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005), which are the previous health risk guidelines for permitting under Rules 1401; and

WHEREAS, additional time is needed to better assess and understand the impacts of using new emissions data received from CARB in March 2015 for gasoline dispensing facilities before use of the Revised OEHHA Guidelines. PAR 1401 allows retail gasoline transfer and dispensing facilities to continue to use SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) and includes a commitment from the Executive Officer to return to the Governing Board as quickly as practicable with Staff's analysis of emissions data from gasoline dispensing activities; and

WHEREAS, a need exists to amend current Rules 1401, 1401.1, 1402, and 212 in order to provide consistency with the Revised OEHHA Guidelines; and

WHEREAS, the SCAQMD staff conducted five regional public workshops and multiple industry group meetings regarding the PAR 1401 et al. and the Revised OEHHA Guidelines; and

WHEREAS, the SCAQMD is not required to prepare a Finding, Statement of Overriding Considerations, or Mitigation Monitoring Plan because the proposed project is not expected to generate significant adverse environmental impacts pursuant to CEQA Guidelines §15091, §15093 and §15097; and

WHEREAS, California Health and Safety Code §40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report; and

WHEREAS, the SCAQMD Governing Board has determined that a need exists to amend Rule 1401 et al. to provide consistency with the methodologies of the Revised OEHHA Guidelines; and

WHEREAS, the SCAQMD Governing Board has determined that PAR 1401 et al., as proposed to be amended, are in harmony with, and not in conflict with, or contradictory to, existing statutes, court decisions, or state or federal regulations; and

WHEREAS, the SCAQMD Governing Board has determined that PAR 1401 et al. is written and displayed so that the meaning can be easily understood by persons directly affected by it. To ensure clarity in the proposed amended rule language, five public workshops were conducted with significant input received from business groups, environmental organizations, other agencies, and the public at large; and

WHEREAS, the SCAQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Sections 39002, 39560 et seq., 40000, 40001, 40440, 40441, 40463, 40702, 40725 through 40723, 41508, 41700, 41706, 42300, and 44390 through 44394 of the California Health and Safety Code; and

WHEREAS, the SCAQMD Governing Board has determined that PAR 1401 et al., as proposed to be amended, do not impose the same requirement as any existing state or federal regulation, and the proposed amended rules are necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD; and

WHEREAS, the SCAQMD Governing Board in amending the regulations, references the following statutes which the SCAQMD hereby implements, interprets or makes specific: Health and Safety Code Sections 39666 (District New Source Review rules for toxics), 41700 (nuisance), 44391 (risk reduction plans), 44300 et seq. (Air Toxics Hot Spots Act), and Federal Clean Air Act Section 112 (Hazardous Air Pollutants); and

WHEREAS, an analysis as required by Health & Safety Code Section 40727.2 has been prepared and is incorporated in the staff report for PAR 1401 et al.; and

WHEREAS, PAR 1401 et al. are not control measures in the 2012 Air Quality Management Plan (AQMP) and thus, were not ranked by cost-effectiveness relative to other control measures in the 2012 AQMP and further, that cost-effectiveness in terms of dollars per ton of pollutant reduced is not applicable to rules regulating toxic air contaminants; and

WHEREAS, PAR 1401 et al. will not be submitted for inclusion into the State Implementation Plan; and

WHEREAS, Health and Safety Code §40727.2 requires the SCAQMD to prepare a written analysis of existing federal air pollution control requirements applicable to the same source type being regulated whenever it adopts, or amends a rule, and that the SCAQMD's comparative analysis of PAR 1401 et al. is included in the staff report; and

WHEREAS, the SCAQMD Governing Board has determined the Socioeconomic Impact Assessment for PAR 1401 et al. complies with the provisions of Health and Safety Code Sections 40440.8 and 40728.5, and that Section 40920.6 is not applicable to rules regulating toxic air contaminants; and

WHEREAS, the SCAQMD Governing Board has determined that the Socioeconomic Assessment of PAR 1401 et al. is consistent with the March 17, 1989 and October 14, 1994 Governing Board Socioeconomic Resolutions for rule adoption; and

WHEREAS, the SCAQMD Governing Board has determined that PAR 1401 et al. will result in increased costs, yet are considered to be reasonable, with a total annualized cost as specified in the Socioeconomic Assessment; and

WHEREAS, the SCAQMD specifies the Director of PAR 1401 et al. as the custodian of the documents or other materials which constitute the record of proceedings upon which the adoption of this proposed amendment is based, which are located at the South Coast Air Quality Management District, 21865 Copley Drive, Diamond Bar, California; and

WHEREAS, a public hearing has been properly noticed in accordance with all provisions of Health and Safety Code Section 40725; and

WHEREAS, the SCAQMD Governing Board has held a public hearing in accordance with all provisions of law; and

WHEREAS, the SCAQMD Governing Board voting to adopt PAR 1401 et al. and to receive and file the support documents to implement the proposed amended rules has reviewed and considered the information contained in the Final EA for PAR 1401 et al. and has determined that the document has been completed in compliance with CEQA; and

NOW, THEREFORE BE IT RESOLVED, that the Governing Board directs staff to continue working with stakeholders to incentivize early risk reductions beyond those required under Rule 1402, to assess current public notification procedures and explore alternatives for such facilities. Report back to the Stationary Source Committee at the earliest practicable date, but no later than September 2015, with staff recommendations; and

BE IT FURTHER RESOLVED, that the Governing Board directs staff to return to the SCAQMD Governing Board as early as practicable with further rule development and/or procedures to address toxic emission from spray booths; and

BE IT FURTHER RESOLVED, that the Governing Board directs staff to continue working with the California Air Resources Board regarding emission factors for retail gasoline dispensing facilities, return to the SCAQMD Governing Board as early as practicable with an analysis of emissions data from gasoline dispensing activities and further rule development and/or procedures, if needed, to address emissions data from gasoline dispensing activities; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board certifies the Final EA for PAR 1401 et al., and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby amend, pursuant to the authority granted by law, PAR 1401 et al. as set forth in the attached, and incorporated herein by reference, and

BE IT FURTHER RESOLVED, that because no significant adverse environmental impacts were identified as a result of implementing PAR 1401 et al., a Finding, a Statement of Overriding Considerations, and a Mitigation Monitoring Plan are not required; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby receive and file the following support documents to implement PAR 1401 et al.: 1) SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 (ver. 8.0), 2) SCAQMD Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act, and 3) SCAQMD Facility Prioritization Procedures for the AB 2588 Program.

DATE: __________________ ________________________

CLERK OF THE BOARDS

(Adopted June 1, 1990)(Amended December 7, 1990)
(Amended July 10, 1998)(Amended January 8, 1999)
(Amended March 12, 1999)(Amended August 13, 1999)
(Amended March 17, 2000)(Amended August 18, 2000)
(Amended June 15, 2001)(Amended May 3, 2002)(Amended February 7, 2003)
(Amended May 2, 2003)(Amended March 4, 2005)(Amended March 7, 2008)
(Amended June 5, 2009)(Amended September 10, 2010)(PAR1401e May 2015)

PROPOSED AMENDED RULE 1401. NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

(a) Purpose

This rule specifies limits for maximum individual cancer risk (MICR), cancer burden, and noncancer acute and chronic hazard index (HI) from new permit units, relocations, or modifications to existing permit units which emit toxic air contaminants listed in Table I. The rule establishes allowable risks for permit units requiring new permits pursuant to Rules 201 or 203.

(b) Applicability

(1) Applications for new, relocated, and modified permit units which were received by the District on or after June 1, 1990 shall be subject to Rule 1401. Applications shall be subject to the version of Rule 1401 that is in effect at the time the application is deemed complete. Permit units installed without a required permit to construct shall be subject to this rule, if the application for a permit to operate such equipment was submitted after June 1, 1990.

(2) This rule shall apply to new, relocated, and modified equipment identified in Rule 219 as not requiring a written permit if the risk from the equipment will be greater than identified in subparagraph (d)(1)(A), or paragraphs (d)(2) or (d)(3) in Rule 1401.

(c) Definitions

(1) ACCEPTABLE STACK HEIGHT for a permit unit is defined as a stack height that does not exceed two and one half times the height of the permit unit or two and one half times the height of the building housing the permit unit, and shall not be greater than 65 meters (213 feet), unless the applicant

demonstrates to the satisfaction of the Executive Officer that a greater height is necessary.

(2) BEST AVAILABLE CONTROL TECHNOLOGY FOR TOXICS (T-BACT) means the most stringent emissions limitation or control technique which:

(A) has been achieved in practice for such permit unit category or class of source; or

(B) is any other emissions limitation or control technique, including process and equipment changes of basic and control equipment, found by the Executive Officer to be technologically feasible for such class or category of sources, or for a specific source.

(3) CANCER BURDEN means the estimated increase in the occurrence of cancer cases in a population subject to a MICR of greater than or equal to one in one million (1.0×10^{-6}) resulting from exposure to toxic air contaminants.

(4) CONTEMPORANEOUS RISK REDUCTION means any reduction in risk resulting from a decrease in emissions of toxic air contaminants at the facility that is permanent, real, quantifiable and enforceable through District permit conditions. Permit applications associated with the increase and decrease in risk must be submitted together and the reduction of risk must occur before the start of operation of the permit unit that will have an increased risk. A contemporaneous risk reduction shall be calculated based on the actual average annual emissions, as determined by facility records, and annual emissions declarations pursuant to Rule 301 as appropriate, or other data approved by the Executive Officer, whichever is less, which have occurred during the two-year period immediately preceding the date of application.

(5) FACILITY means any permit unit or grouping of permit units or other air contaminant-emitting activities which are located on one or more contiguous properties within the District, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in 40 CFR Section 55.2. Such above-described groupings, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Notwithstanding the above, sources or installations involved in

crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.

(6) INDIVIDUAL SUBSTANCE ACUTE HAZARD INDEX (HI) is the ratio of the estimated maximum one-hour concentration of a toxic air contaminant for a potential maximally exposed individual to its acute reference exposure level.

(7) INDIVIDUAL SUBSTANCE CHRONIC HAZARD INDEX (HI) is the ratio of the estimated long-term level of exposure to a toxic air contaminant for a potential maximally exposed individual to its chronic reference exposure level. The chronic hazard index calculations shall include multipathway consideration, if applicable.

(8) MAXIMUM INDIVIDUAL CANCER RISK (MICR) is the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants ~~over a period of 70 years~~ for residential receptor locations calculated pursuant to the Risk Assessment Procedures referenced in subdivision (e). The MICR for worker receptor locations shall be calculated pursuant to the Risk Assessment Procedures referenced in subdivision (e). The MICR calculations shall include multipathway consideration, if applicable.

(9) MODIFICATION means any physical change in, change in method of operation, or addition to an existing permit unit that requires an application for a permit to construct and/or operate. Routine maintenance and/or repair shall not be considered a physical change. A change in the method of operation of equipment, unless previously limited by an enforceable permit condition, shall not include:

(A) an increase in the production rate, unless such increase will cause the maximum design capacity of the equipment to be exceeded; or

(B) an increase in the hours of operation; or

(C) a change in ownership of a source; or

(D) a change in formulation of the materials processed which will not result in a net increase of the MICR, cancer burden, or chronic or acute HI from the associated permit unit.

For facilities that have been issued a facility permit pursuant to Regulation

XX or a Title V permit pursuant to Regulation XXX, modification means any physical change in, change in method of operation of, or addition to an existing individual article, machine, equipment or other contrivance which would have required an application for a permit to construct and/or operate, were the unit not covered under a facility permit or Title V permit.

(10) PERMIT UNIT means any article, machine, equipment, or other contrivance, or combination thereof, which may cause or control the issuance of air contaminants, and which requires a written permit pursuant to Rules 201 and/or 203. For facilities that have been issued a facility permit or Title V permit, a permit unit for the purpose of this rule means any individual article, machine, equipment or other contrivance which may cause or control the issuance of air contaminants and which would require a written permit pursuant to Rules 201 and/or 203 if it was not covered under a facility permit or Title V permit. For publicly-owned sewage treatment operations, each process within multi-process permit units at the facility shall be considered a separate permit unit for purposes of this rule.

(11) RECEPTOR LOCATION means

(A) for the purpose of calculating acute HI, any location outside the boundaries of the facility at which a person could experience acute exposure; and

(B) for the purpose of calculating chronic HI and MICR, any location outside the boundaries of the facility at which a person could experience chronic exposure.

The Executive Officer shall consider the potential for exposure in determining whether the location will be considered a receptor location.

(12) RELOCATION means the removal of an existing permit unit from one parcel of land in the District and installation at another parcel of land where two parcels are not in actual physical contact and are not separated solely by a public roadway or other public right-of-way. The removal of a permit unit from one location within a facility and installation at another location within the facility is a relocation only if an increase in maximum individual cancer risk in excess of one in one million (1×10^{-6}) or a Hazard Index of 1.0 occurs at any receptor location.

(13) TOTAL ACUTE HAZARD INDEX (HI) is the sum of the individual substance acute HIs for all toxic air contaminants affecting the same target organ system.

(14) TOTAL CHRONIC HAZARD INDEX (HI) is the sum of the individual substance chronic HIs for all toxic air contaminants affecting the same target organ system.

(15) TOXIC AIR CONTAMINANT is an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. For the purpose of this rule, toxic air contaminants are those listed in Table I.

(d) Requirements

~~The requirements of paragraphs (d)(2) and (d)(3) shall become effective September 8, 1998.~~ The Executive Officer shall deny the permit to construct a new, relocated or modified permit unit if emissions of any toxic air contaminant listed in Table I may occur, unless the applicant has substantiated to the satisfaction of the Executive Officer all of the following:

(1) MICR and Cancer Burden

The cumulative increase in MICR which is the sum of the calculated MICR values for all toxic air contaminants emitted from the new, relocated or modified permit unit will not result in any of the following:

(A) an increased MICR greater than one in one million (1.0×10^{-6}) at any receptor location, if the permit unit is constructed without T-BACT;

(B) an increased MICR greater than ten in one million (1.0×10^{-5}) at any receptor location, if the permit unit is constructed with T-BACT;

(C) a cancer burden greater than 0.5.

(2) Chronic Hazard Index

The cumulative increase in total chronic HI for any target organ system due to total emissions from the new, relocated or modified permit unit owned or operated by the applicant for which applications were deemed complete on or after the date when the risk value for the compound is finalized by the state Office of Environmental Health Hazard Assessment (OEHHA), unless paragraph (e)(3) applies, will not exceed 1.0 at any receptor location.

(3) Acute Hazard Index

The cumulative increase in total acute HI for any target organ system due to total emissions from the new, relocated or modified permit unit owned or operated by the applicant for which applications were deemed complete on or after the date when the risk value for the compound is finalized by OEHHA, unless paragraph (e)(3) applies, will not exceed 1.0 at any receptor location.

~~(4) Risk Per Year~~

~~The risk per year shall not exceed 1/70 of the maximum allowable risk specified in (d)(1)(A) or (d)(1)(B) divided by the applicable exposure period in the Risk Assessment Procedures referenced in subdivision (e) at any receptor locations in residential areas.~~

(~~5~~4) If a permit contains operating conditions imposed pursuant to Rule 1401, which prohibit or limit the use or emission of toxic air contaminants, those conditions shall apply only to those toxic air contaminants listed in the version of Rule 1401 applicable at the time the permit conditions were imposed.

(~~6~~5) Federal New Source Review for Toxics

Pursuant to Section 112(g) of the federal Clean Air Act (CAA), no person shall begin construction or reconstruction of a major stationary source emitting hazardous air pollutants listed in Section 112 (b) of the CAA, unless the source is constructed with Best Available Control Technology for Toxics (T-BACT) and complies with all other applicable requirements, including definitions and public noticing, referenced in 40 CFR 63.40 through 63.44. The requirements of this paragraph shall not apply to:

(A) any source that is subject to an existing National Emission Standard for Hazardous Air Pollutants (NESHAP) pursuant to sections 112(d), 112(h), or 112(j) of the federal CAA;

(B) any source that is exempted from regulations under a NESHAP issued pursuant to sections 112(d), 112(h), or 112(j) of the federal CAA;

(C) any source that has received all necessary air quality permits for such construction or reconstruction before June 29, 1998;

(D) electric utility steam generating units, unless and until such time as these units are added to the source category list pursuant to the requirements of section 112(c)(5) of the federal CAA;

(E) any sources that are within a source category that has been deleted from the source category list pursuant to section 112(c)(9) of the federal CAA; or

(F) research and development activities.

Compliance with this paragraph does not relieve any owner or operator of a major stationary source from complying with all other applicable District rules and regulations, including this rule, any applicable state airborne toxic control measure, or other applicable state and federal laws. Exemptions under subdivision (g) of this rule do not apply to this paragraph. This paragraph shall take effect retroactively from June 29, 1998.

(e) Risk Assessment Procedures

(1) The Executive Officer shall periodically publish procedures for determining health risks under this rule, except as provided in paragraph (e)(5). To the extent possible, the procedures will be consistent with the most recently adopted policies and procedures of the state ~~Office of Environmental Health Hazard Assessment (~~OEHHA~~)~~.

(2) Within 150 days of risk values for compounds not in Table I being finalized by OEHHA, staff will bring proposed amendments to this rule to reflect changes to Table I.

(3) Within 150 days of risk values for compounds in Table I being updated by OEHHA, staff will:

(A) publish a Notice of Intent to change risk values;

(B) perform an impact assessment, including socioeconomic effects; and

(C) submit a report to the District Governing Board with recommendations for changing the risk values in the procedures for determining risk assessment published pursuant to paragraph (e)(1).

(4) To calculate the cumulative increase in MICR pursuant to paragraph (d)(1), the increase from each permit unit shall be based on the emissions of toxic air contaminants, the risk values, and risk assessment procedures applicable at the time when each complete application was deemed complete by the District.

(5) The following equipment or industry source categories shall be allowed to use SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) in order to calculate the cumulative increase in MICR pursuant to paragraph (d)(1):

(A) spray booths, until the Executive Officer, as quickly as practicable, can make a recommendation regarding a regulation and/or procedures ~~conduct rule development~~, and the Board approves regulations and/or procedures specific to this source category; and

(B) retail gasoline transfer and dispensing facilities as defined in District Rule 461, until the Executive Officer, as quickly as practicable, can provide an analysis of emissions data from gasoline dispensing activities to the Governing Board, and the Board approves regulations and/or procedures, if needed, specific to this industry.

(f) Emissions Calculations

(1) For the purpose of determining MICR and cancer burden due to a new or relocated permit unit pursuant to this rule, the total Toxic Air Contaminant emissions from the new or relocated permit unit shall be calculated on an annual basis from permit conditions which directly limit the emissions or, when no such conditions are imposed, from:

(A) the maximum rated capacity;

(B) the maximum possible annual hours of operation;

(C) the maximum annual emissions; and

(D) the physical characteristics of the materials processed.

(2) For the purpose of determining chronic HI due to a new or relocated permit unit pursuant to this rule, the total emissions from a permit unit shall be calculated on an annual average basis from permit conditions which directly limit the emissions or, when no such conditions are imposed, from:

(A) the maximum rated capacity;

(B) the annual average hours of operation;

(C) the annual average emissions; and

(D) the physical characteristics of the materials processed.

(3) For the purpose of determining MICR, cancer burden and chronic HI due to a modified permit unit pursuant to this rule, the increase in emissions from the modified permit unit shall be calculated based on the difference between the total permitted emissions after the modification, calculated pursuant to the criteria established in subparagraphs (f)(1)(A), (B), (C), and (D), and:

(A) the total permitted emissions prior to the modification as stated in the permit conditions; or

(B) if there are no existing permit conditions that limit emissions, the average annual emissions which have occurred during the two-year period immediately preceding the date of the complete permit application for modification or other appropriate period determined by the Executive Officer to be representative of a permit unit's operation; or

(C) for modification of any source installed prior to October 8, 1976, resulting from the addition of air pollution controls installed solely to reduce the issuance of air contaminants, emission shall be calculated from permit conditions which directly limit the emissions or, when no such conditions are imposed, from:

(i) the maximum rated capacity; and

(ii) the maximum proposed daily hours of operation; and

(iii) the physical characteristics of the materials processed.

(4) For the purpose of determining acute HI due to a new, relocated or modified permit unit pursuant to this rule, the total emissions from a permit unit shall be calculated on a maximum hourly basis from permit conditions which directly limit the emissions or, when no such conditions exist, from:

(A) the maximum rated capacity;

(B) the maximum hourly emissions; and

(C) the physical characteristics of the materials processed.

(5) De Minimus Values

Any permit unit with values at or below the screening levels as specified in the procedures for determining health risks under this rule, published pursuant to paragraph (e)(1), shall be deemed in compliance with the requirements of subdivision (d).

(g) Exemptions

(1) The requirements of subdivision (d) shall not apply to:

(A) Permit Renewal or Change of Ownership

Any permit unit which is in continuous operation, without modification or change in operating conditions, for which a new permit to operate is required solely because of permit renewal or change of ownership.

(B) Modification with No Increase in Risk

A modification of a permit unit that causes a reduction or no increase in the cancer burden, MICR or acute or chronic HI at any receptor location.

(C) Functionally Identical Replacement

A permit unit replacing a functionally identical permit unit, provided there is no increase in maximum rating or increase in emissions of any toxic air contaminants. For replacement of dry cleaning permit units only, provided there is no increase in any toxic air contaminants.

(D) Equipment Previously Exempt Under Rule 219

Equipment which previously did not require a written permit pursuant to Rule 219 that is no longer exempt, provided that the equipment was installed prior to the Rule 219 amendment eliminating the exemption and a complete application for the permit is received within one (1) year after the Rule 219 amendment removing the exemption.

(E) Modifications to Terminate Research Projects

Modifications restoring the previous permit conditions of a permit unit, provided that: the applicant demonstrates that the previous permit conditions were modified solely for the purpose of installing innovative control equipment as part of a demonstration or investigation designed to advance the state of the art with regard to controlling emissions of toxic air contaminants; the emission reductions achieved by the demonstration project are not used for permitting any equipment with emission increases under the contemporaneous emission reduction exemption as specified in paragraph (g)(2); the demonstration project is completed within two (2) years; and a complete application is submitted no later than two (2) years after the date of issuance of the permit which modified the conditions of the previous permit for the purpose of the demonstration or investigation.

(F) Emergency Internal Combustion Engines

Emergency internal combustion engines that are exempted under Rule 1304.

(G) Wood Product Stripping

Wood product stripping permit units, provided that the risk increases due to emissions from the permit unit owned or operated by the applicant for which complete applications were submitted on or after July 10, 1998 will not exceed a MICR of 100 in one million (1.0×10^{-4}) or a total acute or chronic hazard index of five (5) at any receptor location. This exemption shall not apply to permit applications received after January 10, 2000, or sooner if the Executive Officer makes a determination that T-BACT is available to enable compliance with the requirements of paragraphs (d)(1), (d)(2) and (d)(3).

(H) Gasoline Transfer and Dispensing Facilities

For gasoline transfer and dispensing facilities, as defined in Rule 461 – Gasoline Transfer and Dispensing, the Executive Officer shall not, for the purposes of paragraphs (d)(1) through (d)(~~5~~4), consider the risk contribution of methyl tert-butyl ether for any gasoline transfer and dispensing permit applications deemed complete on or before December 31, 2003. If the state of California extends the phase-out requirement for methyl tert-butyl ether as an oxygenate in gasoline, the limited time exemption shall be extended to that expiration date or December 31, 2004, whichever is sooner.

(2) Contemporaneous Risk Reduction

(A) ~~The requirements of p~~Paragraph~~s~~ (d)(1) ~~and (d)(4)~~ shall not apply if the applicant demonstrates that a contemporaneous risk reduction resulting in a decrease in emissions will occur such that both of the following conditions are met:

(i) no receptor location will experience a total increase in MICR of greater than one in one million (1.0×10^{-6}) due to the cumulative impact of both the permit unit and the contemporaneous risk reduction; and

(ii) the contemporaneous risk reduction occurs within 100 meters of the permit unit.

T-BACT shall be used on permit units exempted under this subparagraph if the MICR from the permit unit exceeds one in one million (1.0×10^{-6}).

(B) The requirements of paragraphs (d)(2) and (d)(3) shall not apply if the applicant substantiates to the satisfaction of the Executive Officer that a contemporaneous risk reduction will occur such that any increase in individual substance acute or chronic HI from the permit unit exceeding 1.0 is mitigated with an equal or greater decrease in the same individual substance acute or chronic HI, respectively, from the contemporaneous risk reduction such that both of the following conditions are met:

(i) no receptor location will experience an increase in total acute or chronic HI of more than 1.0 due to the cumulative impact of both the permit unit and the contemporaneous risk reduction; and

(ii) the contemporaneous risk reduction occurs within 100 meters of the permit unit.

(3) Alternate Hazard Index Levels

The requirements of paragraphs (d)(2) and (d)(3) shall not apply if the applicant substantiates to the satisfaction of the Executive Officer that at all receptor locations and for every target organ system, the total chronic and acute HI level resulting from emissions from the new, modified or relocated permit unit owned or operated by the applicant for which applications were submitted on or after July 10, 1998 shall not exceed alternate HI levels which are determined by the Executive Officer in consultation with the Office of Environmental Health Hazard Assessment to be protective against adverse health effects. No alternate HI level shall exceed 10.

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
75-07-0	acetaldehyde	December 7, 1990	September 8, 1998	September 10, 2010
60-35-5	acetamide	January 8, 1999		
107-02-8	acrolein		June 15, 2001	August 13, 1999
79-06-1	acrylamide (or propenamide)	December 7, 1990	**	
79-10-7	acrylic acid		*	August 13, 1999
107-13-1	acrylonitrile (or vinyl cyanide)	December 7, 1990	May 3, 2002	
107-05-1	allyl chloride	January 8, 1999		
117-79-3	aminoanthraquinone, 2-	January 8, 1999		
7664-41-7	ammonia		August 18, 2000	August 13, 1999
62-53-3	aniline	January 8, 1999		
7440-38-2	**arsenic and arsenic compounds (inorganic)** including, but not limited to: arsenic compounds (inorganic)	December 7, 1990	June 15, 2001	August 13, 1999
7784-42-1	arsine		September 10, 2010	August 13, 1999
1332-21-4	asbestos	June 1, 1990		
71-43-2	benzene (including benzene from gasoline)	June 1, 1990	August 18, 2000	August 13, 1999
92-87-5	benzidine (and its salts)	December 7, 1990	**	
100-44-7	benzyl chloride	September 8, 1998	**	August 13, 1999

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	**SUBSTANCE**	**EFFECTIVE DATE CANCER**	**EFFECTIVE DATE CHRONIC**	**EFFECTIVE DATE ACUTE**
7440-41-7	beryllium and beryllium compounds	December 7, 1990	May 3, 2002	
111-44-4	bis(2-chloroethyl)ether (DCEE)	December 7, 1990		
117-81-7	bis(2-ethylhexyl)phthalate (DEHP)	September 8, 1998	**	
542-88-1	bis(chloromethyl)ether	December 7, 1990		
7789-30-2	bromine pentafluoride		*	
106-99-0	butadiene, 1,3-	December 7, 1990	June 15, 2001	
7440-43-9	cadmium and cadmium compounds	June 1, 1990	June 15, 2001	
75-15-0	carbon disulfide		May 3, 2002	August 13, 1999
56-23-5	carbon tetrachloride (or tetrachloromethane)	June 1, 1990	June 15, 2001	August 13, 1999
7782-50-5	chlorine		August 18, 2000	August 13, 1999
10049-04-4	chlorine dioxide		June 15, 2001	
95-83-0	chloro-o-phenylenediamine, 4-	January 8, 1999		
95-69-2	chloro-o-toluidine, p-	January 8, 1999		
108-90-7	chlorobenzene		June 15, 2001	
	chlorofluorocarbons			
75-43-4	dichlorodifluoromethane (CFC-12)		*	
75-69-4	trichlorofluoromethane (CFC-11)		*	
76-13-1	trichlorotrifluoroethane (CFC-113)		*	

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
67-66-3	chloroform (trichloromethane)	December 7, 1990	August 18, 2000	August 13, 1999
	Chlorophenols			
95-57-8	chlorophenol, 2-		*	
88-06-2	trichlorophenol, 2,4,6-	December 7, 1990		
	tetrachlorophenols (TECPH)		*	
87-86-5	pentachlorophenol	September 8, 1998	**	
76-06-2	chloropicrin		May 3, 2002	August 13, 1999
126-99-8	chloroprene		**	
18540-29-9	**chromium (hexavalent) and chromium compounds**	June 1, 1990	June 15, 2001	
	including, but not limited to:			
7758-97-6	lead chromate	September 8, 1998	**	
1333-82-0	chromic trioxide		June 15, 2001	
7440-50-8	copper and copper compounds		*	August 13, 1999
120-71-8	cresidine, p-	January 8, 1999		
1319-77-3	**cresols/cresylic acid (all isomers and mixture)**		June 15, 2001	
108-39-4	cresol, m-		June 15, 2001	

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
95-48-7	cresol, o-		June 15, 2001	
106-44-5	cresol, p-		June 15, 2001	
135-20-6	cupferron	January 8, 1999		
	dialkylnitrosamines			
924-16-3	nitrosodi-n-butylamine, n-	December 7, 1990		
621-64-7	nitrosodi-n-propylamine, n-	September 8, 1998		
55-18-5	nitrosodiethylamine, n-	December 7, 1990		
62-75-9	nitrosodimethylamine, n-	December 7, 1990		
10595-95-6	nitrosomethylethylamine, n-	September 8, 1998		
615-05-4	diaminoanisole, 2,4- (sulfate)	January 8, 1999		
95-80-7	diaminotoluene, 2,4-	January 8, 1999		
	dibenzo-p-dioxins (chlorinated)			
1746-01-6	tetrachlorodibenzo-p-dioxin, 2,3,7,8-	June 1, 1990	August 18, 2000	
40321-76-4	pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	June 1, 1990	August 18, 2000	
39227-28-6	hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	June 1, 1990	August 18, 2000	
57653-85-7	hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	June 1, 1990	August 18, 2000	
19408-74-3	hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	June 1, 1990	August 18, 2000	
35822-46-9	heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	June 1, 1990	August 18, 2000	
3268-87-9	octachlorodibenzo-p-dioxin,	June 1, 1990	August 18, 2000	

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
	1,2,3,4,5,6,7,8-			
41903-57-5	total tetrachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
36088-22-9	total pentachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
34465-46-8	total hexachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
37871-00-4	total heptachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
	total dioxins, with individual isomers reported	June 1, 1990	August 18, 2000	
	total dioxins, without individual isomers reported	June 1, 1990	August 18, 2000	
	dibenzofurans (chlorinated)			
51207-31-9	tetrachlorodibenzofuran, 2,3,7,8-	June 1, 1990	August 18, 2000	
57117-41-6	pentachlorodibenzofuran, 1,2,3,7,8-	June 1, 1990	August 18, 2000	
57117-31-4	pentachlorodibenzofuran, 2,3,4,7,8-	June 1, 1990	August 18, 2000	
70648-26-9	hexachlorodibenzofuran, 1,2,3,4,7,8-	June 1, 1990	August 18, 2000	
57117-44-9	hexachlorodibenzofuran, 1,2,3,6,7,8-	June 1, 1990	August 18, 2000	
72918-21-9	hexachlorodibenzofuran, 1,2,3,7,8,9-	June 1, 1990	August 18, 2000	
60851-34-5	hexachlorodibenzofuran, 2,3,4,6,7,8-	June 1, 1990	August 18, 2000	
67562-39-4	heptachlorodibenzofuran, 1,2,3,4,6,7,8-	June 1, 1990	August 18, 2000	

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
55673-89-7	heptachlorodibenzofuran, 1,2,3,4,7,8,9-	June 1, 1990	August 18, 2000	
39001-02-0	octachlorodibenzofuran, 1,2,3,4,5,6,7,8	June 1, 1990	August 18, 2000	
55722-27-5	total tetrachlorodibenzofuran	June 1, 1990	August 18, 2000	
30402-15-4	total pentachlorodibenzofuran	June 1, 1990	August 18, 2000	
55684-94-1	total hexachlorodibenzofuran	June 1, 1990	August 18, 2000	
38998-75-3	total heptachlorodibenzofuran	June 1, 1990	August 18, 2000	
96-12-8	dibromo-3-chloropropane, 1,2- (DBCP)	September 8, 1998	**	
106-46-7	dichlorobenzene, 1,4- (or p-dichlorobenzene)	September 8, 1998	June 15, 2001	
91-94-1	dichlorobenzidine, 3,3	December 7, 1990		
75-34-3	dichloroethane, 1,1-	January 8, 1999		
75-35-4	dichloroethylene, 1,1-		June 15, 2001	
9901 (emittant ID)	diesel PM – diesel particulate matter from diesel-fueled internal combustion engine exhaust	March 7, 2008	March 7, 2008	
111-42-2	diethanolamine		May 3, 2002	
60-11-7	dimethylaminoazobenzene, p-	January 8, 1999		
68-12-2	dimethylformamide (N,N-)		June 15, 2001	
121-14-2	dinitrotoluene, 2,4-	December 7, 1990		
123-91-1	dioxane, 1,4- (or 1,4-diethylene dioxide)	December 7, 1990	August 18, 2000	August 13, 1999

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
106-89-8	epichlorohydrin (or 1-chloro-2,3-epoxypropane)	December 7, 1990	June 15, 2001	August 13, 1999
106-88-7	epoxybutane,1,2-		June 15, 2001	
140-88-5	ethyl acrylate		*	
100-41-4	ethyl benzene	June 5, 2009	August 18, 2000	
75-00-3	ethyl chloride (or chloroethane)		August 18, 2000	
106-93-4	ethylene dibromide (or 1,2-dibromoethane)	June 1, 1990	May 3, 2002	
107-06-2	ethylene dichloride (or 1,2-dichloroethane)	June 1, 1990	June 15, 2001	
75-21-8	ethylene oxide (or 1,2-epoxyethane)	June 1, 1990	June 15, 2001	
96-45-7	ethylene thiourea	January 8, 1999		
1101	Fluorides (except hydrogen fluoride, listed separately below)		September 10, 2010	
50-00-0	formaldehyde	December 7, 1990	August 18, 2000	August 13, 1999
	gasoline vapors		*	
111-30-8	glutaraldehyde		June 15, 2001	
	glycol ethers (and their acetates)			
107-21-1	ethylene glycol		August 18, 2000	
111-76-2	ethylene glycol butyl ether		*	August 13, 1999

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
110-80-5	ethylene glycol ethyl ether		August 18, 2000	February 10, 1999
111-15-9	ethylene glycol ethyl ether acetate		August 18, 2000	August 13, 1999
109-86-4	ethylene glycol methyl ether		August 18, 2000	August 13, 1999
110-49-6	ethylene glycol methyl ether acetate		August 18, 2000	
118-74-1	hexachlorobenzene	December 7, 1990	**	
608-73-1	**hexachlorocyclohexanes (mixed or technical grade)**	December 7, 1990	**	
58-89-9	hexachlorocyclohexane, gamma- (lindane)	September 8, 1998	**	
77-47-4	hexachlorocyclopentadiene		*	
110-54-3	hexane		August 18, 2000	
302-01-2	hydrazine	September 8, 1998	June 15, 2001	
122-66-7	hydrazobenzene (or 1,2-diphenylhydrazine)	December 7, 1990		
7647-01-0	hydrochloric acid (or hydrogen chloride)		August 18, 2000	August 13, 1999
7664-39-3	hydrofluoric acid (or hydrogen fluoride)		September 10, 2010	August 13, 1999
10035-10-6	hydrogen bromide (HBR)		*	
74-90-8	hydrogen cyanide		August 18, 2000	August 13, 1999
7783-06-4	hydrogen sulfide		August 18, 2000	February 10, 1999
7783-07-5	hydrogen selenide			August 13, 1999

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
	isocyanates			
624-83-9	methyl isocyanate		May 3, 2002	
78-59-1	isophrone		May 3, 2002	
67-63-0	isopropyl alcohol		August 18, 2000	August 13, 1999
7439-92-1	**lead and lead compounds (inorganic, including elemental lead)** including, but not limited to:	September 8, 1998	**	
	lead compounds (inorganic)	September 8, 1998	**	
301-04-2	lead acetate	September 8, 1998	**	
7758-97-6	lead chromate	September 8, 1998	**	
7446-27-7	lead phosphate	September 8, 1998	**	
1335-32-6	lead subacetate	September 8, 1998	**	
	lead compounds (other than inorganic)	September 8, 1998	**	
108-31-6	maleic anhydride		May 3, 2002	
7439-96-5	manganese and manganese compounds		August 18, 2000	

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
7439-97-6	**mercury and mercury compounds (inorganic)**		August 18, 2000	August 13, 1999
	including, but not limited to:			
7487-94-7	mercuric chloride		August 18, 2000	
593-74-8	methyl mercury		August 18, 2000	
67-56-1	methanol (methyl alcohol)		August 18, 2000	August 13, 1999
74-83-9	methyl bromide (or bromomethane)		August 18, 2000	August 13, 1999
71-55-6	methyl chloroform (or 1,1,1-trichloroethane)		August 18, 2000	August 13, 1999
78-93-3	methyl ethyl ketone		*	August 13, 1999
80-62-6	methyl methacrylate		*	
1634-04-4	methyl tert-butyl ether	May 2, 2003	August 18, 2000	
101-14-4	methylene bis(2-chloroaniline), 4,4- (MOCA)	January 8, 1999		
75-09-2	methylene chloride (or dichloromethane)	June 1, 1990	August 18, 2000	August 13, 1999
101-77-9	methylene dianiline, 4,4'- (and its dichloride)	September 8, 1998	May 3, 2002	
101-68-8	methylene phenyl diisocyanate		June 15, 2001	
1135	mineral fibers (other than man-made)		*	
90-94-8	michler's ketone	January 8, 1999		
7440-02-0	**nickel and nickel compounds:**	March 12, 1999	August 18, 2000	August 13, 1999

TABLE I TOXIC AIR CONTAMINANTS				
CAS #	**SUBSTANCE**	**EFFECTIVE DATE CANCER**	**EFFECTIVE DATE CHRONIC**	**EFFECTIVE DATE ACUTE**
	including, but not limited to:			
373-02-4	nickel acetate	March 12, 1999	August 18, 2000	August 13, 1999
3333-67-3	nickel carbonate	March 12, 1999	August 18, 2000	August 13, 1999
13463-39-3	nickel carbonyl	March 12, 1999	August 18, 2000	August 13, 1999
12054-48-7	nickel hydroxide	March 12, 1999	August 18, 2000	August 13, 1999
1313-99-1	nickel oxide	March 12, 1999	August 18, 2000	August 13, 1999
12035-72-2	nickel subsulfide	December 7, 1990	August 18, 2000	August 13, 1999
1271-28-9	nickelocene	March 12, 1999	August 18, 2000	August 13, 1999
	refinery dust from the pyrometallurgical process	December 7, 1990	August 18, 2000	August 13, 1999
7697-37-2	nitric acid		*	August 13, 1999
98-95-3	nitrobenzene		*	
79-46-9	nitropropane, 2-		*	
759-73-9	nitroso-n-ethylurea, n-	December 7, 1990		
684-93-5	nitroso-n-methylurea, n-	December 7, 1990		
86-30-6	nitrosodiphenylamine, n-	December 7, 1990		
156-10-5	nitrosodiphenylamine, p-	September 8, 1998		
59-89-2	nitrosomorpholine, n-	January 8, 1999		

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
100-75-4	nitrosopiperidine, n-	January 8, 1999		
930-55-2	nitrosopyrrolidine, n-	December 7, 1990		
108171-26-2	paraffins, chlorinated (average chain length, c12; approx. 60% cl by weight)	January 8, 1999		
127-18-4	perchloroethylene (or tetrachloroethylene)	September 8, 1998	September 8, 1998	August 13, 1999
108-95-2	phenol		August 18, 2000	August 13, 1999
75-44-5	phosgene		*	August 13, 1999
7723-14-0	**phosphorus and phosphorus compounds**		*	
7803-51-2	phosphine		February 7, 2003	
7664-38-2	phosphoric acid		August 18, 2000	
85-44-9	phthalic anhydride		June 15, 2001	
1336-36-3	**polychlorinated biphenyls (PCBs)**	December 7, 1990	**	
	3,3’,4,4’ Tetrachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	3,4,4’,5 Tetrachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3,3’,4,4’ Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3,4,4’,5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3’,4,4’,5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2’,3,4,4’,5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
	3,3',4,4',5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3,3',4,4',5 Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3,3',4,4',5' Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3',4,4',5.5' Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	3,3',4,4',5,5' Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	2,3,3'4,4',5,5' Heptachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	polycyclic aromatic hydrocarbons (PAHs)			
56-55-3	benz[a]anthracene	December 7, 1990		
50-32-8	benzo[a]pyrene	December 7, 1990		
205-99-2	benzo[b]fluoranthene	December 7, 1990		
205-82-3	benzo[j]fluoranthene	January 8, 1999		
207-08-9	benzo[k]fluoranthene	December 7, 1990		
218-01-9	chrysene	December 7, 1990		
226-36-8	dibenz[a,h]acridine	January 8, 1999		
224-42-0	dibenz[a,j]acridine	January 8, 1999		
53-70-3	dibenz[a,h]anthracene	December 7, 1990		
192-65-4	dibenzo[a,e]pyrene	January 8, 1999		

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
189-64-0	dibenzo[a,h]pyrene	January 8, 1999		
189-55-9	dibenzo[a,i]pyrene	January 8, 1999		
191-30-0	dibenzo[a,l]pyrene	January 8, 1999		
194-59-2	dibenzo[c,g]carbazole, 7h-	January 8, 1999		
57-97-6	dimethylbenz[a]anthracene, 7,12-	January 8, 1999		
42397-64-8	dinitropyrene, 1,6-	January 8, 1999		
42397-65-9	dinitropyrene, 1,8-	January 8, 1999		
193-39-5	indeno[1,2,3-cd]pyrene	December 7, 1990		
56-49-5	methylcholanthrene, 3-	January 8, 1999		
3697-24-3	methylchrysene, 5-	January 8, 1999		
91-20-3	naphthalene	March 4, 2005***	August 18, 2000	
602-87-9	nitroacenaphthene, 5-	January 8, 1999		
7496-02-8	nitrochrysene, 6-	January 8, 1999		
607-57-8	nitrofluorene, 2-	January 8, 1999		
5522-43-0	nitropyrene, 1-	January 8, 1999		
57835-92-4	nitropyrene, 4-	January 8, 1999		
	polycyclic aromatic hydrocarbons (PAHs), total	September 8, 1998		

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
7758-01-2	potassium bromate	January 8, 1999		
1120-71-4	propane sultone, 1,3-	January 8, 1999		
115-07-1	propylene		August 18, 2000	
107-98-2	propylene glycol methyl ether		August 18, 2000	
75-56-9	propylene oxide (or 1,2-epoxy propane)	September 8, 1998	February 23, 2000	August 13, 1999
7782-49-2	**selenium and selenium compounds** other than hydrogen selenide		May 3, 2002	
1310-73-2	sodium hydroxide		*	August 13, 1999
100-42-5	styrene (or vinyl benzene)		August 18, 2000	August 13, 1999
7664-93-9	sulfuric acid (and oleum)		May 3, 2002	August 13, 1999
79-34-5	tetrachloroethane, 1,1,2,2-	January 8, 1999		
62-55-5	thioacetamide	January 8, 1999		
108-88-3	toluene (or methyl benzene)		August 18, 2000	August 13, 1999
	toluene diisocyanates			
584-84-9	toluene-2,4-diisocyanate	September 8, 1998	June 15, 2001	
91-08-7	toluene-2,6-diisocyanate	September 8, 1998	June 15, 2001	
79-00-5	trichloroethane, 1,1,2-	January 8, 1999		
79-01-6	trichloroethylene	December 7, 1990	August 18, 2000	
121-44-8	triethylamine		February 7, 2003	August 13, 1999

TABLE I

TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
51-79-6	urethane (or ethyl carbamate)	September 8, 1998		
1314-62-1	vanadium pentoxide			August 13, 1999
108-05-4	vinyl acetate		May 3, 2002	
75-01-4	vinyl chloride (or chloroethylene)	December 7, 1990	**	August 13, 1999
75-35-4	vinylidene chloride		*	
1330-20-7	**xylenes (isomers and mixture)**		August 18, 2000	August 13, 1999
108-38-3	xylene, m-		August 18, 2000	August 13, 1999
95-47-6	xylene, o-		August 18, 2000	August 13, 1999
106-42-3	xylene, p-		August 18, 2000	August 13, 1999
7440-66-6	**zinc and zinc compounds**		*	
	including, but not limited to:			
1314-13-2	zinc oxide		*	

* Compounds not classified as carcinogenic, but have chronic risk values proposed by OEHHA that have not yet been finalized. The effective date is the date the Scientific Review Panel approves the chronic risk value, unless paragraph (e)(3) applies. Paragraph (e)(3) applies when the finalized chronic risk value differs from the value in the latest version of the Risk Assessment Procedures published pursuant to paragraph (e)(1).

** Compounds are classified as carcinogenic, but have chronic risk values proposed by OEHHA that have not yet been finalized. The effective date for use of chronic risk values is the date the Scientific Review Panel approves the chronic risk value, unless paragraph (e)(3) applies.

*** Effective date for these risk values will be March 4, 2005 or date of implementation of the applicable Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0), whichever is later.

TABLE II

TOXIC AIR CONTAMINANTS WITH PROPOSED RISK VALUES

CAS #	SUBSTANCE
79-10-7	acrylic acid
107-05-1	allyl chloride
7783-20-2	ammonium sulfate
62-53-3	Aniline
1309-64-4	antimony trioxide
	arsenic compounds (other than inorganic)
532-27-4	chloroacetophenone, 2-
75-45-6	chlorodifluoromethane (HCFC-22)
7440-48-4	cobalt and cobalt compounds
74-85-1	Ethylene
96-45-7	ethylene thiourea
	fluorides and fluoride compounds
87-68-3	hexachlorobutadiene
67-72-1	hexachloroethane
822-06-0	hexamethylene-1,6-diisocyanate
78-93-3	methyl ethyl ketone (or 2-butanone)
7697-37-2	nitric acid
156-10-5	nitrosodiphenylamine, p-
7440-22-4	silver and silver compounds
96-09-3	styrene oxide
79-00-5	trichloroethane, 1,1,2-
593-60-2	vinyl bromide

ATTACHMENT F2

(Adopted November 4, 2005)
(PAR1401.1b – March 2015)

PROPOSED AMENDED RULE 1401.1 **REQUIREMENTS FOR NEW AND RELOCATED FACILITIES NEAR SCHOOLS**

(a) Purpose

The purpose of this rule is to provide additional health protection to children at schools or schools under construction from new or relocated facilities emitting toxic air contaminants.

(b) Applicability

This rule applies to new and relocated, but not to existing facilities. Applications for Permit to Construct/Operate from such new or relocated facilities shall be evaluated under this rule using the list of toxic air contaminants in the version of Rule 1401 and the risk assessment procedures that ~~is~~ are in effect at the time the application is deemed complete.

(c) Definitions

(1) CANCER RISK means, for the purpose of this rule, the estimated probability of an exposed individual contracting cancer as a result of exposure to toxic air contaminants at a school or a school under construction calculated pursuant to Rule 1401 (d) ~~assuming an exposure duration of 70 years~~.

(2) CALIFORNIA ENVIRONMENTAL QUALITY ACT NOTICE (CEQA NOTICE) means, for the purpose of this rule, a Notice of Preparation of project level Environmental Impact Report was sent to the appropriate agencies pursuant to Section 15082 of the CEQA Guidelines or a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration was provided to the parties pursuant to Section 15072 pursuant to the CEQA Guidelines.

(3) EXISTING FACILTY means any facility that:

(A) demonstrates to the satisfaction of the Executive Officer that it had equipment requiring a Permit to Construct/Operate that was in operation prior to November 4, 2005 or

(B) has an application for Permit to Construct/Operate that is deemed complete prior to February 2, 2006.

(4) FACILITY means any permit unit or grouping of permit units or other air contaminant-emitting activities which are located on one or more contiguous properties within the District, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in 40 CFR Section 55.2. Such above-described groupings, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Notwithstanding the above, sources or installations involved in crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.

(5) FACILITY-WIDE ACUTE HAZARD INDEX means the sum of the calculated individual substance acute hazard indices for the target organ due to all toxic air contaminants emitted from all equipment requiring a written permit to operate at the facility.

(6) FACILITY-WIDE CANCER RISK means the sum of the calculated cancer risk values for all toxic air contaminants emitted from all equipment requiring a written permit to operate at the facility.

(7) FACILITY-WIDE CHRONIC HAZARD INDEX means the sum of the calculated individual substance chronic hazard indices for the target organ due to all toxic air contaminants emitted from all equipment requiring a written permit to operate at the facility.

(8) INDIVIDUAL SUBSTANCE ACUTE HAZARD INDEX (HI) means the ratio of the estimated maximum one-hour concentration of a toxic air contaminant for a potential maximally exposed individual at the school to its acute reference exposure level.

(9) INDIVIDUAL SUBSTANCE CHRONIC HAZARD INDEX (HI) means the ratio of the estimated long-term level of exposure to a toxic air contaminant for a potential maximally exposed individual at the school to its chronic reference exposure level. The chronic hazard index calculations shall include multipathway consideration, if applicable.

(10) MODIFICATION means any physical change in, change in method of

operation, or addition to an existing permit unit that requires an application for a Permit to Construct/Operate. Routine maintenance and/or repair shall not be considered a physical change. A change in the method of operation of equipment, unless previously limited by an enforceable permit condition, shall not include:

(A) an increase in the production rate, unless such increase will cause the maximum design capacity of the equipment to be exceeded; or

(B) an increase in the hours of operation; or

(C) a change in ownership of a source; or

(D) a change in formulation of the materials processed which will not result in a net increase of the MICR, cancer burden, or chronic or acute HI from the associated permit unit.

For facilities that have been issued a facility permit pursuant to Regulation XX or a Title V permit pursuant to Regulation XXX, modification means any physical change in, change in method of operation of, or addition to an existing individual article, machine, equipment or other contrivance which would have required an application for a permit to construct and/or operate, were the unit not covered under a facility permit or Title V permit.

(11) NEW FACILITY means a facility or an operation that is not an existing or relocated facility.

(12) PERMIT UNIT means any article, machine, equipment, or other contrivance, or combination thereof, which may cause or control the issuance of air contaminants, and which requires a written permit pursuant to Rules 201 and/or 203. For facilities that have been issued a facility permit or Title V permit, a permit unit for the purpose of this rule means any individual article, machine, equipment or other contrivance which may cause or control the issuance of air contaminants and which would require a written permit pursuant to Rules 201 and/or 203 if it were not covered under a facility permit or Title V permit. For publicly-owned sewage treatment operations, each process within multi-process permit units at the facility shall be considered a separate permit unit for purposes of this rule.

(13) RELOCATED FACILITY means the removal of all existing permitted equipment, remaining under the same ownership, from one parcel of land and installation of the same equipment or functionally identical

replacement of the equipment at another parcel of land where the two parcels are not in actual physical contact and are not separated solely by a public roadway or other public right-of-way.

(14) SCHOOL means any public or private school, including juvenile detention facilities with classrooms, used for purposes of the education of more than 12 children at the school, including in kindergarten and grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes. The term includes any building or structure, playground, athletic field, or other area of school property, but does not include unimproved school property.

(15) SCHOOL UNDER CONSTRUCTION means any property that meets any of the following conditions and the Executive Officer has been notified:

(A) construction of a school has commenced; or

(B) of a CEQA Notice for the construction of a school; or

(C) a school has been identified in an approved local government specific plan.

A school under construction is effective upon the date in which any one of the activities specified in either subparagraph (c)(15)(A), (c)(15)(B), or (c)(15)(C) occurs or the date the Executive Officer has received notification of the activities, whichever is later.

(d) Risk Requirements for New Facilities

The Executive Officer shall deny a Permit to Construct/Operate at a new facility for any permit unit that emits any toxic air contaminant listed in Table I of Rule 1401 unless the applicant has substantiated to the satisfaction of the Executive Officer that all of the following requirements, as applicable, have been achieved. For the purpose of this rule, the cancer risk and hazard indices shall be calculated pursuant to Rule 1401 and the applicable risk assessment procedures. Requirements for new facilities are summarized in Table 1 – Summary of Requirements for New Facilities.

(1) A new facility with a toxic-emitting source that is within 500 feet from the outer boundary of a school or school under construction shall comply with all of the following requirements.

(A) Cancer Risk

The facility-wide cancer risk shall not exceed one in one million

(1 x 10^{-6}) at any school or school under construction within 500 feet of the toxic-emitting permit unit(s) at the facility; and

(B) Chronic Hazard Index

The facility-wide chronic HI for any target organ system shall not exceed 1.0 at any school or school under construction within 500 feet of the toxic-emitting permit unit(s) at the facility; and

(C) Acute Hazard Index

The facility-wide acute HI for any target organ system shall not exceed 1.0 at any school or school under construction within 500 feet of the toxic-emitting permit unit(s) at the facility.

(2) For a new facility where the closest outer boundary of a school or school under construction is between 500 to 1,000 feet from the toxic-emitting permit unit(s) and there is no residential or sensitive receptor within 150 feet of the proposed toxic-emitting permit unit(s), the facility shall not exceed the risk levels specified in subparagraphs (d)(1)(A), (d)(1)(B), and (d)(1)(C) at any school or school under construction within 1,000 feet of the toxic-emitting permit unit(s) at the facility.

(e) Risk Requirements for Relocated Facilities

The Executive Officer shall deny a Permit to Construct/Operate at a relocated facility for any permit unit that emits any toxic air contaminant listed in Table I of Rule 1401 unless the applicant has substantiated to the satisfaction of the Executive Officer that all of the following requirements, as applicable, have been achieved. For the purpose of this rule, the cancer risk and hazard indices shall be calculated pursuant to Rule 1401 and the applicable risk assessment procedures. Requirements for relocated facilities are summarized in Table 2 – Summary of Requirements for Relocated Facilities. For each school or school under construction whose outer boundary is within 500 feet of the toxic-emitting permit unit(s) at a relocated facility, the relocated facility shall demonstrate that either:

(1) The facility-wide cancer risk and hazard indices at each school or school under construction do not exceed the risk values at the same school or school under construction when the facility was at its previous location; or

(2) The facility-wide cancer risk at the school or school under construction does not exceed 1 in one million and the facility-wide chronic and acute hazard indices for any target organ system do not exceed 1.0.

(f) Risk Calculations for New and Relocated Facilities

(1) The owner or operator of a new facility complying with the requirements specified under paragraphs (d)(1) or (d)(2), or the owner or operator of a relocated facility complying with the requirements specified under paragraphs (e)(1) or (e)(2), shall calculate the risk for any schools or schools under construction at the time of a CEQA Notice for the new or relocated facility or, if there is no CEQA Notice for the new or relocated facility, at the time the first permit application is deemed complete.

(2) If the owner or operator of a new or relocated facility subject to (f)(1) does not commence construction within three years of the CEQA Notice for the new or relocated facility, the owner or operator shall calculate the risk for any schools or schools under construction at the time the application for Permit to Construct/Operate is deemed complete, unless the owner or operator has submitted written verification to the Executive Officer that the CEQA Notice is still applicable for the new or relocated facility.

(g) Requirements for New or Relocated Facilities for Additional Information in Rule 212 Notices

When ~~Rule 212~~public notice is required by subparagraph (c)(1) of Rule 212, any new or relocated facility with toxic-emitting permit unit(s) within 1,000 feet of the outer boundary of a school that has a facility-wide cancer risk exceeding one in one million at any such school shall include in the notice the facility-wide cancer risk at that school in addition to the information required pursuant to Rule 212 – Standards for Approving Permits and Issuing Public Notice.

(h) Requirements for New or Relocated Facilities for New Equipment, Modification, Alteration, and Change of Condition

For any subsequent application for new equipment or modification, alteration, and change of conditions of a permit to operate, regardless of whether it remains under the same ownership, any new or relocated facility subject to Rule 1401.1 shall:

(1) meet the requirements of subdivisions (d), (e), (f), and (g), as applicable; and

(2) be required to calculate cancer and non-cancer risk or add risk values for Rule 212 notices for any school specified in subdivisions (d), (e), (f), and

(g), whichever is applicable.

(i) Exemptions

(1) The following equipment is exempt from inclusion in the facility-wide cancer risk, facility-wide acute hazard index, and facility-wide chronic hazard index for this rule.

(A) Emergency internal combustion engines that are exempted from modeling and offset requirements under Rule 1304.

(B) Engines subject to Rule 1470 – Requirements for Stationary Diesel-Fueled Internal Combustion Engines and Other Compression Ignition Engines.

(C) Equipment permitted solely for in-situ remediation of contaminated soil and/or groundwater.

(D) Equipment permitted for use at various locations throughout the District and that does not remain at one site for more than 12 consecutive months.

(E) Experimental research operations permitted under Rule 441 – Research Operations operating for one year or less.

(F) Equipment located at new or relocated facilities that are exempted from a written permit under Rule 219.

(2) If the Executive Officer has been notified and can confirm that a school will not be constructed at a specific location, that property is no longer considered a school under construction pursuant to paragraph (c)(15).

Table 1 – Summary of Requirements for New Facilities

Distance from New Facility to Nearest School or School Under Construction	**Other Residential or Sensitive Receptor at < 150 ft**	***Risk Demonstration at School at < 500 ft**	***Risk Demonstration at School at 500 – 1,000 ft**	**Rule 212 Additional Information**	**Meet Requirements for Future Applications**
		Paragraph (d)(1)	**Paragraph (d)(2)**	**Subdivision (f)**	**Subdivision (g)**
< 500 feet	N/A	Yes	N/A	N/A	Yes
500 – 1,000 ft	Yes	N/A	N/A	Yes	Yes
500 – 1,000 ft	No	N/A	Yes	N/A	Yes

*Risk Demonstration at school or school under construction for New Facility:
≤ 1 in one million cancer risk and hazard indices ≤ 1.0

Table 2 – Summary of Requirements for Relocated Facilities

Distance from Relocated Facility to Nearest School or School Under Construction	***Risk Demonstration at School at < 500 ft**	**Rule 212 Additional Information**	**Meet Requirements for Future Applications**
	Subdivision (e)	**Subdivision (f)**	**Subdivision (g)**
< 500 feet	Yes	Yes	Yes
500 – 1,000 ft	N/A	Yes	Yes

*Risk Demonstration at school or school under construction for Relocated Facility:
≤ 1 in one million cancer risk and hazard indices ≤ 1.0
or no increase in cancer risk or hazard indices

ATTACHMENT F3

(Adopted April 8, 1994)(Amended March 17, 2000)
(Amended March 4, 2005)(PAR1402c – May 2015)

PROPOSED AMENDED RULE 1402. CONTROL OF TOXIC AIR CONTAMINANTS FROM EXISTING SOURCES

(a) Purpose

The purpose of this rule is to reduce the health risk associated with emissions of toxic air contaminants from existing sources by specifying limits for maximum individual cancer risk (MICR), cancer burden, and noncancer acute and chronic hazard index (HI) applicable to total facility emissions and by requiring facilities to implement risk reduction plans to achieve specified risk limits, as required by the Hot Spots Act and this rule. The rule also specifies public notification and inventory requirements.

(b) Applicability

This rule shall apply to any facility subject to the Hot Spots Act and to any facility for which the impact of total facility emissions exceeds any significant or action risk level as indicated in one of the following:

(1) A health risk assessment prepared by the District or for the purpose of this rule for a facility or category of facilities, including but not limited to facilities for which the District has prepared an industrywide emissions inventory pursuant to the Hot Spots Act; or

(2) A health risk assessment pursuant to paragraph (b)(2), the risk reduction requirements of this rule shall not apply to facilities which have not been notified by the District to prepare a health risk assessment pursuant to this rule or the Hot Spots Act.

(c) Definitions

(1) ACCEPTABLE STACK HEIGHT for a permit unit is defined as a stack height that does not exceed two and one half times the height of the permit unit or two and one half times the height of the building housing the permit unit, and shall not be greater than 65 meters (213 feet), unless the operator demonstrates to the satisfaction of the Executive Officer that a greater height is necessary.

(2) ACTION RISK LEVEL for purpose of this rule is a MICR of twenty-five in one million (25 x 10^{-6}), cancer burden of 0.5, or a total acute or chronic HI of three (3.0) for any target organ system at any receptor location.

(3) CANCER BURDEN means the estimated increase in the occurrence of cancer cases in a population subject to a MICR of greater than or equal to one in one million (1 x 10^{-6}) resulting from exposure to toxic air contaminants.

(4) FACILITY means any permit unit or grouping of permit units or other air contaminant-emitting activities which are located in one or more contiguous properties within the District, in actual physical contact or separately solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or persons under common control). Such above-described groupings, if remotely located and connected only by land carrying a pipeline, shall not be considered one facility.

(5) HOT SPOTS ACT means the Air Toxics "Hot Spots" Information and Assessment Act of 1987, incorporated at Part 6, Division 26 of the Health and Safety Code, and amendments to this act

(6) INDIVIDUAL SUBSTANCE ACUTE HAZARD INDEX (HI) is the ratio of the estimated maximum one-hour, or other time period as specified by the Executive Officer, concentration of a toxic air contaminant at a receptor location to its acute reference exposure level.

(7) INDIVIDUAL SUBSTANCE CHRONIC HAZARD INDEX (HI) is the ratio of the long-term level of exposure to a toxic air contaminant for a potential maximally exposed individual to the chronic reference exposure level for the toxic air contaminant.

(8) INITIAL PLAN SUBMITTAL DATE is the date that the initial risk reduction plan is submitted to the District, but no later than 180 days following notification by the Executive Officer that a risk reduction plan is required.

(9) MAXIMUM INDIVIDUAL CANCER RISK (MICR) is the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants ~~over a period of 70 years~~ calculated pursuant to the Risk Assessment Procedures referenced in subdivision (j) for residential receptor locations. The MICR for worker receptor locations shall be calculated pursuant to the Risk Assessment

Procedures referenced in subdivision (j). The MICR calculations shall include multi-pathway consideration if applicable.

(10) OPERATOR means the person who owns or operates a facility or part of a facility.

(11) PHASE I FACILITY is any facility that either emitted more than 25 tons per year of any criteria pollutant or was listed in a toxics emitters list, and was required to submit emissions inventory reports pursuant to the Hot Spots Act for the calendar year 1989.

(12) RECEPTOR LOCATION means

(A) for the purpose of calculating acute HI, any location outside the boundaries of the facility at which a person could experience acute exposure; and

(B) for the purpose of calculating chronic HI, MICR, or cancer burden any location outside the boundaries of the facility at which a person could experience chronic exposure.

The Executive Officer shall consider the possibility of potential exposure at a location in determining whether the location will be considered a receptor location.

(13) RISK REDUCTION MEASURE is a control measure which will reduce or eliminate the health risk associated with emissions of toxic air contaminants, is real, permanent, quantifiable, and enforceable through District permit conditions if applicable, and meets the requirements of the Hot Spots Act. Risk reduction measures may include, but are not limited to feedstock modification; product reformulations; production system modifications; system enclosure, emissions control, capture or conversion; operational standards or practices modifications; emissions collection and exhaust; source control; or alternative technologies.

(14) SIGNIFICANT RISK LEVEL for purpose of this rule is a MICR of one hundred in one million (1.0×10^{-4}), or a total acute or chronic HI of five (5.0) for any target organ system at any receptor location.

(15) TOTAL ACUTE HAZARD INDEX (HI) is the sum of the individual substance acute HIs for all toxic air contaminants identified in the risk assessment guidelines as affecting the same target organ system.

(16) TOTAL CHRONIC HAZARD INDEX (HI) is the sum of the individual substance chronic HIs for all toxic air contaminants identified in the risk assessment guidelines as affecting the same target organ system.

(17) TOXIC AIR CONTAMINANT is an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health.

(d) Requirements

Notwithstanding the requirements of subdivision (n), within 150 days of the date of notification by the Executive Officer, an operator shall submit to the District a health risk assessment for total facility emissions. The Executive Officer may require a health risk assessment or an emissions inventory from a facility when, based upon investigation, the Executive Officer determines that emission levels from the facility could potentially cause exceedance of the action risk levels.

(e) Risk Reduction Requirements

The following requirements shall apply to the operator of any facility whose emissions ~~cause an~~cause an exceedance~~ance~~ of any significant or action risk level as indicated in a health risk assessment approved or prepared by the District:

(1) Any operator whose facility-wide risk is greater than or equal to the action risk level shall implement the risk reduction measures specified in a risk reduction plan approved by the Executive Officer to reduce the impact of total facility emissions below the action risk level as quickly as feasible but by no later than three (3) years from the initial plan submittal date.

(2) For any operator whose facility-wide risk is less than the significant risk level, the Executive Officer may approve time extensions to comply with paragraph (e)(1) in increments of up to two (2) additional years to implement risk reduction measures and achieve required risk reductions, provided the operator demonstrates one or more of the following criteria:

(A) there is no known technology or risk reduction measure that is commercially available or can achieve required risk reductions within the required time period; or

(B) the only known technology or risk reduction measure that can be implemented within the facility that will meet the facility-wide risk reduction requirements within the required time period will result in a cost impact that exceeds both of the following:

(i) $4,000,000 per cancer case avoided; and

(ii) $18,000 per ton of pollutant reduced if the TAC is also a criteria pollutant.

(C) Any extension beyond the first two year extension for each facility must be approved by the Governing Board in a public hearing before going into effect.

(3) The operator shall implement risk reduction measures in an approved plan by the dates specified in the plan for each risk reduction measure.

(f) Submittal of Risk Reduction Plans

(1) The Executive Officer will publish procedures for preparing risk reduction plans under this rule. The procedures will include self-conducted audits and checklists which may be used by certain categories of facilities in lieu of preparing a risk reduction plan.

(2) An operator shall submit a risk reduction plan to the Executive Officer as specified in Table A.

Table A
Risk Reduction Plan Submittal Dates

Applicability	Health Risk Assessment (HRA) Approval Date	Plan Submittal Date
Any Facility ≥ Action Risk Level	Before March 17, 2000	180 Days After March 17, 2000
	On and After March 17, 2000	180 Days After HRA Approval Date
Notification by Executive Officer	Not Applicable	180 Days from date of notification from Executive Officer

(3) The operator shall submit to the Executive Officer for approval a risk reduction plan which includes at a minimum all of the following:

(A) The name, address, SCAQMD identification number and SIC code of the facility;

(B) A facility risk characterization which includes an updated air toxics emission inventory and health risk assessment, if the risk due to total facility emissions has increased above or decreased below the levels indicated in the previously approved health risk assessment;

(C) Identification of each source from which risk needs to be reduced in order to achieve a risk below the action risk level.

(D) For each source identified in subparagraph (f)(3)(C), an evaluation of the risk reduction measures available to the operator, including emission and risk reduction potential, estimated costs, and time necessary for implementation;

(E) Specification of the risk reduction measures that shall be implemented by the operator to comply with the requirements of subdivision (e) to achieve the action risk level or the lowest achievable level;

(F) A schedule for implementing the specified risk reduction measures as quickly as feasible. The schedule shall include the submittal of all necessary applications for permits to construct or modify within 180 days of approval of the plan, or in accordance with another schedule subject to approval of the Executive Officer, and specify the dates for other increments of progress associated with implementation of the risk reduction measures;

(G) If requesting a time extension, information required to demonstrate that the request meets the required criteria specified under paragraph (e)(2) and the length of time up to two years requested;

(H) An estimation of the residual health risk after implementation of the specified risk reduction measures;

(I) Proof of certification of the risk reduction plan as meeting all requirements by an individual who is officially responsible for the processes and operations of the facility.

(g) Approval of Risk Reduction Plans

(1) The Executive Officer shall approve or reject the plan within three (3) months of submittal based on the complete information contained in paragraph (f)(3). The operator may appeal the rejection of a plan or the failure of the Executive Officer to act on a plan submittal to the Hearing Board under Rule 216 - Appeals. If the Hearing Board denies the appeal, plans shall be revised and resubmitted within 90 days after the decision. The revised plan shall correct all deficiencies identified by the Executive Officer. The approved plan shall be subject to Rule 221 - Plans.

(2) If the risk reduction plan contains a facility risk characterization demonstrating to the satisfaction of the Executive Officer that the facility does not exceed the action risk level, the plan may be approved without the inclusion of the plan components specified in subparagraphs (f)(3)(C) through (H).

(3) Measures to achieve risk reductions required by the approved plan shall be incorporated by the Executive Officer through enforceable permit

conditions or compliance plans.

(h) Progress Reports

The operator shall submit to the Executive Officer for review annual progress report(s), starting no later than 12 months after approval of the plan pursuant to subdivision (g), on the emissions and risk reduction achieved by the plan which include at a minimum all of the following:

(1) The increments of progress achieved in implementing the risk reduction measures specified in the plan;

(2) A schedule indicating dates for future increments of progress;

(3) Identification of any increments of progress that have been or will be achieved later than specified in the plan and the reason for achieving the increments late;

(4) A description of any increases or decreases in emissions of toxic air contaminants that have occurred at the facility, including a description of any associated permits that were subject to Rule 1401, since approval of the plan.

(i) Updating and Modification of Risk Reduction Plans

(1) If information becomes known to the Executive Officer after the last submitted plan that would substantially impact risks to exposed persons, implementation, or effectiveness of the risk reduction plan, the Executive Officer may require the plan to be updated and resubmitted.

(2) Prior to a change in the risk reduction measures or schedule specified in the currently approved plan, the operator shall submit to the Executive Officer for approval an application for plan modification. The application shall include a demonstration that the change in the risk reduction measures is necessary and will result in compliance with this rule to achieve the risk level as specified in the approved plan. Any request for a time extension shall be made at least 180 days before the end of the applicable deadline to achieve the required facility-wide risk level that is specified in the approved risk reduction plan.

(j) Risk Assessment Procedures

(1) The Executive Officer shall periodically publish or designate procedures for determining health risks under this rule. To the extent possible, the procedures shall be consistent with the policies and procedures of the

Office of Environmental Health Hazard Assessment (OEHHA). Such procedures shall specify:

(A) Acute and chronic reference exposure levels and upper bound estimates of carcinogenic potency that shall be used in evaluating risks;

(B) Compounds that must be subject to a multiple pathway risk assessment. A compound is subject to multiple pathway analysis if the Executive Officer determines that it may reasonably be expected to cause health risk through ingestion exposure, if it is expected to deposit and persist in the environment after emission, and if a quantitative oral cancer potency estimate or reference exposure level has been derived for the compound;

(C) Health protective assumptions that shall be used in evaluating exposure to compounds from inhalation and other routes of exposure.~~ This will include an assumption of a 70 year period of operation for the sources of toxic air contaminants;~~

(D) Risk for the potential maximally exposed individual ~~shall be based upon continuous exposure for 70 years~~ in residential areas and health protective estimates of exposure duration in nonresidential areas;

(E) Estimates of pollutant dispersion and risk from a source shall not be based upon stack height in excess of acceptable stack height as defined in (c)(1).

(2) Within 120 days of publication of risk assessment guidelines required to be published by the OEHHA pursuant to the Air Toxics "Hot Spots" Information and Assessment Act of 1987, the Executive Officer shall report to the District Governing Board if there are any material differences between the OEHHA guidelines and the criteria specified in this rule and recommend for Board approval whether to proceed with amendments to this rule in order to make the rule consistent with the OEHHA guidelines before their designation as the risk assessment guidelines under this rule.

(3) Promptly after OEHHA finalizes the identification of a new TAC or revises a risk value for an existing TAC, staff will provide notice to the Governing Board and affected industries. Use of any new TAC or a more stringent risk value in health risk assessments for this rule shall be 12 months after the Governing Board receives and files the report containing

such notification, unless the Governing Board approves another implementation schedule through an official Board action.

(4) Also, within 150 days of new chemicals being identified or changes in risk values being finalized by OEHHA, staff will report to the District's Governing Board regarding preliminary estimates of Rule 1402 program impacts that are associated with the new values.

(5) The Executive Officer will publish procedures for determining the emissions estimates to be used in risk assessments in cases in which a compound has not been detected in analyses which have been conducted according to District-approved methods, including procedures for excluding such compounds from risk assessments. The procedures shall provide methods for estimating the most likely emission levels of non-detected compounds based on consideration of the likelihood of presence and the method detection limits of compounds.

(k) Alternate Hazard Index Levels

An alternate hazard index level may be used as the action risk level for a particular total acute or chronic HI if the Executive Officer, in consultation with the Office of Environmental Health Hazard Assessment, determines that such alternate hazard index level is protective against adverse health effects. The alternate HI level shall not in any case exceed 10. The facility operator shall attain the alternate HI level for the action risk level.

(l) Compliance with this rule does not authorize the emission of a toxic air contaminant in violation of any federal, state, local or District law or regulation or exempt the operator from any law or regulation.

(m) Risk reduction measures implemented in order to comply with other regulatory requirements are acceptable risk reduction measures for the purposes of this rule, provided they are consistent with the requirements of this rule.

(n) Emissions Inventory Requirements

(1) These emission inventory requirements are applicable to the operator of any facility that has not yet submitted a total facility toxic emissions inventory under the Hot Spots Program, where:

(A) the facility emits one or more toxic air contaminants on Table I and its annual emissions exceed one or more of the threshold(s) identified in Table I; or

(B) the primary business operation of the facility is listed in Table II and its annual emissions exceed one or more of the threshold(s) identified in Table II.

(2) The operator of any facility subject to subparagraph (n)(1)(A) shall submit an emissions inventory within 60 days of notification from the Executive Officer.

(3) The operator of any facility subject to subparagraph (n)(1)(B) shall submit an inventory within 60 days of notification from the Executive Officer, unless the AQMD Governing Board adopts a source-specific rule prior to three years after March 17, 2000 that specifically exempts the industry, of which the facility is a member, from the inventory provisions of this rule.

(4) The operator of any facility that is required to submit an emissions inventory pursuant to subparagraph (n)(1)(A) shall submit an inventory that includes the toxic air contaminant(s) identified in Table I applicable to the facility. The operator of any facility that is required to submit an emissions inventory pursuant to subparagraph (n)(1)(B) shall submit an inventory that includes: (1) the toxic air contaminant(s) listed in Table II within the industry category that is applicable to the facility; and (2) the toxic air contaminants listed in Table I applicable to the facility, if applicable. The emissions inventory shall be prepared consistent with the emissions inventory methodology specified by "ARB's Emissions Inventory Criteria and Guidelines" (July 1997) and/or any subset of these Guidelines as specified by the Executive Officer.

(o) Phase I Facility Health Risk Assessment Revision Requirements

(1) Any operator of a Phase I facility that was required to submit a Hot Spots health risk assessment and has not received District approval on the health risk assessment, due to a request by the operator to update the inventory, shall submit to the District by July 1, 2000 or earlier, as requested by the Executive Officer, a revised total facility inventory for the year 1995 or later which meets the requirements of the Hot Spots Act.

(2) Phase I facilities requested to provide a revised facility inventory pursuant to paragraph (o)(1), that fail to do so, shall be subject to public notification requirements on the most recent inventory data and OEHHA reviewed risk assessment that is subject to District approval that the facility submitted to the District pursuant to the Hot Spots Act.

(p) Public Notification Requirements

(1) The operator of any facility for which total facility risk, as determined through a District approved HRA or progress report, exceeds the action risk level shall provide the following public notification 12 months after the Executive Officer approves the risk reduction plan and every 12 months thereafter, until the total facility risk is below the action risk level:

(A) written public notification to report the progress of risk reductions pursuant to the most recent Board approved "Public Notification Procedures for Phase I and II Facilities Under the Air Toxics Hot Spots Information and Assessment Act" Section III.C.2. Public Notice Materials, which requires notice materials written in both English and Spanish, and additional languages as deemed appropriate by the Executive Officer; Section III.C.3. Area of Distribution (Area of Impact); Section III.C.4. Method of Distribution; and Section III.C.5. Verification of Distribution.; and

(B) public meetings if the total facility risk, as determined through a District approved HRA or the progress report, exceeds a MICR of one hundred in one million (100×10^{-6}), pursuant to the "Public Notification Procedures for Phase I and II Facilities Under the Air Toxics Hot Spots Information and Assessment Act" Section III.D. Public Meetings.

(2) Any operator with a facility-wide risk that exceeds an MICR of 10 in one million or a Hazard Index of 1.0 (0.5 for lead) as determined through a District approved HRA, shall notice the public in accordance with California Health and Safety Code Section 44362 and the most recently District approved "Public Notification Procedures for Phase I and II Facilities Under the Air Toxics Hot Spots Information and Assessment Act".

TABLE I
EMISSIONS REPORTING THRESHOLDS FOR SPECIFIC TACs

TAC	THRESHOLD
1,3 Butadiene	~~5~~ 2 lb/yr
Benzene	~~25~~ 14 lb/yr
Cadmium	~~0.2~~0.09 lb/yr
Formaldehyde	~~150~~ 67 lb/yr
Hexavalent Chromium	~~0.005~~0.002 lb/yr
Methylene Chloride	~~825~~ 400 lb/yr
Nickel	~~3.3~~1.5 lb/yr
Perchloroethylene	~~140~~ 67 lb/yr

TABLE II
EMISSIONS REPORTING THRESHOLDS FOR SPECIFIC INDUSTRIES

INDUSTRY	TAC	THRESHOLD
Biomedical Sterilizing Operations	Ethylene Oxide	~~10~~ 4.5 lb/yr
Dry Cleaning	Perchloroethylene	~~140~~ 67 lb/yr
	Methylene Chloride	~~825~~ 400 lb/yr
Gasoline Stations	Benzene in Gasoline	~~25~~ 14 lb/yr
Metal Finishing	Hexavalent Chromium	~~0.005~~0.002 lb/yr
	Cadmium	~~0.2~~0.09 lb/yr
	Nickel	~~3.3~~1.5 lb/yr
	Copper	500 lb/yr
Motion Picture Film Processing	Perchloroethylene	~~140~~ 67 lb/yr
Rubber	Chlorinated Dibenzofurans, Benzene, Xylenes, Toluene, Phenol, and Methylene Chloride	1,000 lb of rubber product cured/ processed per year
Wood Stripping/Refinishing,	Methylene Chloride	~~825~~ 400 lb/yr
	DEHP	~~350~~ 32 lb/yr
	Glycol ethers and their acetates, Ethylene Glycol (Mono)Methyl Ether, and Ethylene Glycol (Mono)Ethyl Ether Acetate	500 lb/yr
	Ethylene Glycol (Mono)Butyl Ether and Ethylene Glycol (Mono)Ethyl Ether	2,000 lb/yr
	Ethylene Glycol (Mono)Methyl Ether Acetate and Ethylene Glycol (Mono)Methyl Ether	~~15,000~~1,000 lb/yr

(Adopted January 9, 1976)(Amended July 6, 1984)
(Amended May 17, 1985)(Amended May 1, 1987)
(Amended July 10,1987)(Amended March 3, 1989)
(Amended June 28, 1990)(Amended September 6, 1991)
(Amended August 12, 1994)(Amended December 7, 1995)
(Amended November 14, 1997)(PAR 212c – March 2015)

PROPOSED AMENDED RULE 212. STANDARDS FOR APPROVING PERMITS AND ISSUING PUBLIC NOTICE

(a) The Executive Officer shall deny a Permit to Construct or a Permit to Operate, except as provided in Rule 204, unless the applicant shows that the equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce, or control the issuance of air contaminants, is so designed, controlled, or equipped with such air pollution control equipment that it may be expected to operate without emitting air contaminants in violation of provisions of Division 26 of the State Health and Safety Code or of these rules.

(b) If the Executive Officer finds that the equipment has not been constructed in accordance with the permit and provides less effective air pollution control than the equipment specified in the Permit to Construct, he shall deny the Permit to Operate.

(c) Prior to granting a Permit to Construct or permit modification for a project requiring notification, all addresses within the area described in subdivision (d) of this rule shall be notified of the Executive Officer's intent to grant a Permit to Construct or permit modification at least 30 days prior to the date action is to be taken on the application. For the purpose of this rule, a project requiring notification is:

(1) any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX that may emit air contaminants located within 1000 feet from the outer boundary of a school. This subdivision shall not apply to a modification of an existing facility if the Executive Officer determines that the modification will result in a reduction of emissions of air contaminants from the facility and no increase in health risk at any receptor location. (This paragraph shall not apply to modifications that have no potential to affect emissions.); or,

(2) any new or modified facility which has on-site emission increases exceeding any of the daily maximums specified in subdivision (g) of this

rule; or

(3) any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX with increases in emissions of toxic air contaminants, for which the Executive Officer has made a determination that a person may be exposed to:

(A) a maximum individual cancer risk greater than, or equal to:

(i) one in a million (1×10^{-6}), per guidelines published by the Executive Officer under Rule 1401 (e), ~~during a lifetime (70 years)~~ for facilities with more than one permitted unit, source under Regulation XX, or equipment under Regulation XXX, unless the applicant demonstrates to the satisfaction of the Executive Officer that the total facility-wide maximum individual cancer risk is below ten in a million (10×10^{-6}) using the risk assessment procedures and toxic air contaminants specified under Rule 1402; or,

(ii) ten in a million (10×10^{-6}), per guidelines published by the Executive Officer under Rule 1401 (e), ~~during a lifetime (70 years)~~ for facilities with a single permitted unit, source under Regulation XX, or equipment under Regulation XXX; or

(B) quantities or concentrations of other substances that pose a potential risk of nuisance.

Unless otherwise stated, toxic and potentially toxic air contaminants are substances listed in Table I of Rule 1401 and their cancer risk shall be evaluated using Rule 1401 risk assessment procedures. Toxic air contaminants may also include other substances determined by the Executive Officer to be potentially toxic. Paragraph (c)(2) of this rule shall not apply if the Executive Officer determines that modifications to the existing facility will not result in an increase in health risk at any receptor location.

(d) Except as provided for in subdivision (g) of this rule, the notification of the proposed construction of a project specified under subdivision (c) of this rule, which is to be prepared by the District, is to contain sufficient detail to fully describe the project. The applicant shall provide verification to the Executive Officer that public notice has been distributed as required by this subdivision. In the case of notifications performed under paragraphs (c)(2) and (c)(3) of this rule, the applicant for the Permit to Construct or permit modification shall be responsible for the distribution of the public notice to each address within a 1/4 mile radius of the project or such other area as determined appropriate by the Executive Officer. In the case of notifications performed under paragraph (c)(1) of this rule, distribution of the public notice shall be to the parents or legal guardians of children in any school within 1/4 mile of the facility and the applicant shall provide distribution of the public notice to each address within a radius of 1000 feet from the outer property line of the proposed new or modified facility.

(e) Any person may file a written request for notice of any decision or action pertaining to the issuance of a Permit to Construct. The Executive Officer shall provide mailed notice of such decision or action to any person who has filed a written request for notification. Requests for notice shall be filed pursuant to procedures established by the Executive Officer. The notice shall be mailed at the time that the Executive Officer notifies the permit applicant of the decision or action. The ~~10-day~~ period to appeal, as specified in subdivision (b) of Rule 216, shall commence on the third day following mailing of the notice pursuant to this subdivision. The requirements for public notice pursuant to this subdivision are fulfilled if the Executive Officer makes a good faith effort to follow procedures established pursuant to this subdivision for giving notice and, in such circumstances, failure of any person to receive the notice shall not affect the validity of any permit subsequently issued by the Executive Officer.

(f) An application for a Permit to Operate, for a permit unit installed or constructed without a required Permit to Construct, shall be subject to the requirements of this rule.

(g) For new or modified sources subject to Regulation XIII, RECLAIM facilities, or Outer Continental Shelf (OCS) facilities located within 25 miles of the State's seaward boundary and for which the District has been designated as the corresponding onshore area (COA), which undergo construction or modifications resulting in an emissions increase exceeding any of the daily maximums specified as follows:

Air Contaminant	Daily Maximum in lbs per Day
Volatile Organic Compounds	30
Nitrogen Oxides	40
PM_{10}	30
Sulfur Dioxide	60

Carbon Monoxide	220
Lead	3

The process for public notification and comment shall include all of the applicable provisions of 40 Code of Federal Regulations (CFR) Part 51, Section 51.161(b), and 40 CFR Part 124, Section 124.10. The federal public notice and comment procedures for these facilities require that the public notice be distributed to the broadest possible scope of interested parties, and include at a minimum:

(1) Availability of information submitted by the owner or operator and of District analyses of the effect on air quality for public inspection in at least one location in the area affected;

(2) Notice by prominent advertisement in the area affected of the location of the source information and the District's analyses of the effect on air quality;

(3) Mailing a copy of the notice required in paragraph (g)(2) of this rule to the following persons: The applicant, the Administrator of U. S. EPA through Region 9, the Air Resources Board, affected local air pollution control districts, the chief executives of the city and county or the onshore area that is geographically closest to where the major stationary source or major modification would be located, any comprehensive regional land use planning agency, and State, Federal Land Manager, or Indian Governing Body whose lands may be affected by emissions from the regulated activity; and,

(4) A 30-day period for submittal of public comments.

(h) The Executive Officer may combine public notices to avoid duplication provided that all required public notice requirements are satisfied.

ATTACHMENT G

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

~~Draft~~ Staff Report

Proposed Amended Rules
212 – Standards for Approving Permits and Issuing Public Notice
1401 – New Source Review of Toxic Air Contaminants
1401.1 – Requirements for New and Relocated Facilities Near Schools, and
1402 – Control of Toxic Air Contaminants from Existing Sources

~~March~~June 2015

Deputy Executive Officer
Planning, Rule Development, and Area Sources
Philip M. Fine, Ph.D.

Assistant Deputy Executive Officer
Planning, Rule Development, and Area Sources
Jill Whynot

Director of Strategic Initiatives
Planning, Rule Development, and Area Sources
Susan Nakamura

Authors:	Eugene Kang – Program Supervisor Mike Morris – Program Supervisor
Technical Assistance:	Ian MacMillan – ~~Program Supervisor~~Manager Jillian Wong – Program Supervisor Victoria Moaveni – Senior Air Quality Engineer Hoshik Yoo – Air Quality Specialist Jack Cheng – Air Quality Specialist James Koizumi – Air Quality Specialist Robert Wu – Air Quality Specialist
Reviewed by:	Barbara Baird – Chief Deputy Counsel William Wong – Principal Deputy District Counsel

TABLE OF CONTENTS

EXECUTIVE SUMMARY	
BACKGROUND	ES-1
PROPOSED AMENDMENTS TO RULES 212, 1401, 1401.1, AND 1402	ES-1
PUBLIC PROCESS AND OUTREACH EFFORTS	ES-2
CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS	ES-~~2~~3
CHAPTER 1: BACKGROUND	
INTRODUCTION	1-1
SCAQMD'S AIR TOXIC REGULATORY PROGRAM	1-1
PROPOSED AMENDMENTS TO RULES 1401, 1401.1, 1402, AND 212	1-2
PUBLIC PROCESS AND OUTREACH EFFORTS	1-3
OEHHA	1-4
TOXIC AIR CONTAMINANTS	1-4
HEALTH RISK ASSESSMENT	1-5
SCAQMD RISK ASSESSMENT PROCEDURES	1-5
SUMMARY OF SCAQMD RULES 1401, 1401.1, 1402, AND 212	1-7
CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULES	
OVERVIEW	2-1
PROPOSED AMENDMENTS TO RULE 1401	2-1
PROPOSED AMENDMENTS TO RULE 1401.1	2-2
PROPOSED AMENDMENTS TO RULE 1402	2-~~2~~3
PROPOSED AMENDMENTS TO RULE 212	2-3
CHAPTER 3: IMPACT ASSESSMENT	
AFFECTED INDUSTRIES	3-1
IMPACT ANALYSIS APPROACH	3-1
SOCIOECONOMIC ASSESSMENT	3-5
CEQA ANALYSIS	3-5
DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727	3-~~5~~6
COMPARATIVE ANALYSIS	3-7
REFERENCES	R-1
APPENDIX A: RESPONSE TO COMMENTS	A-1

LIST OF TABLES AND FIGURES

Figure 1-1: Trends in Non-Diesel Inhalation Cancer Risk in the South Coast Air Basin

Table 3-1: New or Modified Permits that Potentially Could Require Additional Pollution Controls Using the Revised OEHHA Guidelines

Table 3-2: Potential Air Pollution Control Devices(s) For Use to Reduce Cancer Risk by AB2588 Facilities

Table 3-3: Comparative Analysis of PAR 212, 1401, 1401.1 and 1402 with Federal Regulations

EXECUTIVE SUMMARY

BACKGROUND
PROPOSED AMENDMENTS TO RULES 212, 1401, 1401.1, AND 1402
PUBLIC PROCESS AND OUTREACH EFFORTS
CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

BACKGROUND

The California Office of Environmental Health Hazard Assessment (OEHHA) establishes risk exposure information (i.e., risk values) for toxic air contaminants (TACs). Additionally, AB2588 requires that OEHHA develop health risk assessment guidelines for implementation of the Hot Spots Program (Health and Safety Code Section 44360(b)(2)). In 2003, OEHHA developed and approved the Health Risk Assessment Guidance (2003 OEHHA Guidelines). Since the adoption of the 2003 guidelines, new scientific information has shown that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. Based on this information, OEHHA approved the Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines) on March 6, 2015. The Revised OEHHA Guidelines incorporate age sensitivity factors which will increase estimated cancer risk ~~estimates~~ to residential and sensitive receptors, based on the change in methodology, by approximately 3 times, and more than 3 times in some cases depending on whether the toxic air contaminant has multiple pathways of exposure in addition to inhalation. Under the Revised OEHHA Guidelines, even though the toxic emissions from a facility have not increased, estimated cancer risk to a residential receptor will increase. Cancer risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged.

PROPOSED AMENDMENTS TO RULES 1401, 1401.1, 1402, AND 212

The SCAQMD relies on OEHHA's health risk assessment guidelines in various aspects of its toxics regulatory program including the permitting program, AB2588 Hot Spots Program, and existing regulatory program. Amendments to the following rules are being proposed to reference the Revised OEHHA Guidelines for estimation of health risks:

- Rule 1401 – New Source Review of Toxic Air Contaminants
- Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools
- Rule 1402 – Control of Toxic Air Contaminants from Existing Sources
- Rule 212 – Standards for Approving Permits and Issuing Public Notice

The proposed amended rules will revise definitions and risk assessment procedures to be consistent with the Revised OEHHA Guidelines. Proposed amendments are to ensure SCAQMD staff can implement the Revised OEHHA Guidelines regarding how health risks are calculated. Staff is not recommending revisions to the health risk thresholds in Rules 1401, 1401.1 or 1402. Staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212.

The California Air Resources Board (CARB) and the California Air Pollution Control Officers Association's (CAPCOA) are finalizing Risk Management Guidelines for Permitting and AB2588 to be consistent with the Revised OEHHA Guidelines that are expected to recommend ~~the~~ using the 95th percentile breathing rate for children under two years of age to the last trimester of pregnancy and the 80th percentile breathing rate for all other ages. CARB and CAPCOA's Risk Management Guidelines are expected to be considered by the CARB Board in ~~May~~ 2015.

The SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212 and the Supplemental Guidelines for Preparing Risk Assessments for AB2588 will also incorporate these modified breathing rates.

PUBLIC PROCESS AND OUTREACH EFFORTS

Development of PAR 212, 1401, 1401.1, and 1402 is being conducted through a public process. As part of the generalized work plan presented at the March 2015 Governing Board meeting, SCAQMD staff began~~has begun~~ an extensive outreach and communication effort, including mailing 22,000 public workshop notices, to immediately engage all stakeholders regarding the Revised OEHHA Guidelines, including amendments to Rules 212, 1401, 1401.1, and 1402. SCAQMD staff has ~~been meeting~~met with industry groups to discuss the Revised OEHHA Guidelines. As part of the outreach efforts, staff ~~will~~ hosted five regional Public Workshops in March and April of 2015 throughout the Basin. The five public workshops were~~are~~ as follows:

- **March 31, 2015 at 10:00 a.m.**
  Norton Regional Events Center
  Auditorium
  1601 E. 3rd Street, San Bernardino, CA 92408
- **March 31, 2015 at 2:00 p.m.**
  Louis Robidoux Public Library
  Community Room
  5840 Mission Boulevard, Riverside, CA 92509
- **April 1, 2015 at 10:00 a.m.**
  SCAQMD Auditorium
  21865 Copley Drive, Diamond Bar, CA 91765
- **April 2, 2015 at 10:00 a.m.**
  Buena Park Community Center Ballroom
  6688 Beach Boulevard, Buena Park, CA 90621
- **April 2, 2015 at 4:00 p.m.**
  Wilmington Senior Citizen Center
  Community Room
  1371 Eubank Avenue, Wilmington, CA 90744

All responses to comments received at the Public Workshops have~~will~~ been included in ~~an~~ Appendix A of this report~~to the Final Staff Report~~. The SCAQMD also conducted additional workshops for the following business groups requesting further information on the subject rule development and the Revised OEHHA Guidelines:

- Southern California Alliance of Publicly Owned Treatment Works (SCAP)
- San Gabriel Valley Legislative Coalition of Chambers
- California Small Business Alliance
- California Health Care Association
- California Council for Environmental and Economic Balance
- Western States Petroleum Association
- City of Industry Chamber of Commerce
- Greater Riverside Chambers of Commerce
- City of Santa Monica Chamber of Commerce

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, SCAQMD staff has evaluated the proposed project and made the appropriate CEQA determination. The public workshop meetings ~~will~~ also ~~solicit~~ solicited public input on any potential environmental impacts from the proposed project. Comments received at the public workshops on any environmental impacts ~~will~~were ~~be~~ considered when developing the final CEQA document for this rulemaking.

CHAPTER 1: BACKGROUND

INTRODUCTION

SCAQMD'S AIR TOXIC REGULATORY PROGRAM

PROPOSED AMENDMENTS TO RULES 1401, 1401.1, 1402, AND 212

PUBLIC PROCESS AND OUTREACH EFFORTS

OEHHA

TOXIC AIR CONTAMINANTS

HEALTH RISK ASSESSMENT

SCAQMD RISK ASSESSMENT PROCEDURES

SUMMARY OF SCAQMD RISK-BASED RULES

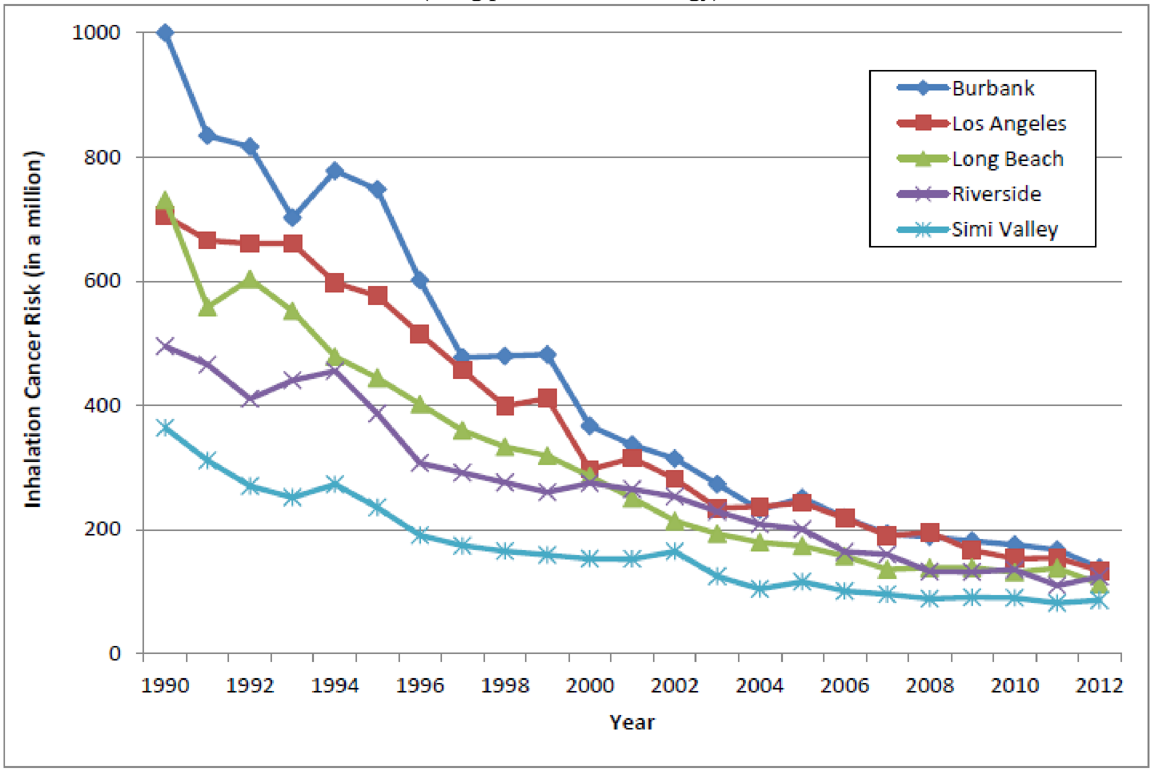
INTRODUCTION

On March 6, 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) approved revisions to their Risk Assessment Guidelines (Revised OEHHA Guidelines). The Revised OEHHA Guidelines were triggered by the passage of the Children's Health Protection Act of 1999 (SB 25, Escutia) requiring OEHHA to ensure infants and children are explicitly addressed in assessing risk. Over the past decade, advances in science have shown that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer, or other adverse health effects, compared to exposures that occur in adulthood. The new risk assessment methodology addresses this greater sensitivity and incorporates the most recent data on infants and childhood and adult exposure to air toxics. The Revised OEHHA Guidelines incorporate age sensitivity factors and other changes which will increase estimated cancer risk ~~estimates~~ to residential and sensitive receptors, based on the change in methodology, by approximately 3 times, and more than 3 times in some cases depending on whether the toxic air contaminant has multiple pathways of exposure in addition to inhalation. Health risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged. Even though there may be no increase in toxic emissions at a facility, the estimated cancer risk using the Revised OEHHA Guidelines is expected to increase.

SCAQMD'S AIR TOXICS REGULATORY PROGRAM

The SCAQMD has a robust and comprehensive air toxics regulatory program that consists of rules to address new and modified toxic sources, AB2588 facilities (existing toxic sources), and source-specific toxic rules. Rules 1401, 1401.1, and 1402 are referred to as the "umbrella" rules that specify ~~requires~~ requirements for all new and modified permitted sources (Rules 1401 and 1401.1 for sources near schools) and requirements for the existing sources under the Air Toxics Hot Spots program (Rule 1402). In addition to these umbrella toxics rules, the SCAQMD's regulatory program includes over fifteen source-specific toxic rules regulating specific equipment or industry categories such as chrome plating, asbestos remediation, lead emission reductions, percholoroethylene dry cleaners, diesel internal combustion engines, and others. Over the past few decades, implementation of these programs by the SCAQMD has resulted in significant reductions in toxic emissions by businesses throughout the Basin from a variety of sources. Since the development of SCAQMD's Air Toxics Program in 1990, trends in estimated non-diesel inhalation cancer risks, as illustrated in Figure 1-1, have greatly declined. Although the Revised OEHHA Guidelines would change the estimated cancer risk values in Figure 1-1, this does not change the fact that estimated cancer risks have been significantly reduced between 75 to 86 percent, depending on the location within the Basin. The Revised OEHHA Guidelines do not change the toxic emission reductions already achieved by facilities in the Basin, nor do they change the overall percent reduction in estimated cancer risks. Rather, the Revised OEHHA Guidelines represents a change to the methodologies and calculations used to estimate health risk based on the most recent scientific data on exposure, childhood sensitivity, and breathing rates.

Figure 1-1
Trends in Non-Diesel Inhalation Cancer Risks in the South Coast Air Basin
(using previous methodology)*



***values do not consider OEHHA Revised Guidelines**

PROPOSED AMENDMENTS TO RULES 1401, 1401.1, 1402, AND 212

The SCAQMD relies on OEHHA's health risk assessment guidelines in various aspects of its toxics regulatory program including the permitting program, AB2588 Hot Spots Program, and existing regulatory program. Amendments to the following rules are being proposed to reference the Revised OEHHA Guidelines for estimation health risks:

- Rule 1401 – New Source Review of Toxic Air Contaminants;
- Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools;
- Rule 1402 – Control of Toxic Air Contaminants from Existing Sources; and
- Rule 212 – Standards for Approving Permits and Issuing Public Notice

The proposed amended rules will revise definitions and risk assessment procedures to be consistent with the Revised OEHHA Guidelines. Proposed amendments are to ensure SCAQMD staff can implement the Revised OEHHA Guidelines regarding how health risks are calculated, and staff is not recommending revisions to the health risk thresholds in Rules 1401, 1401.1 or 1402. The SCAQMD staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and the 2015 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212.

The California Air Resources Board (CARB) and the California Air Pollution Control Officers Association's (CAPCOA) are finalizing Risk Management Guidelines for Permitting and AB2588 to be consistent with the Revised OEHHA Guidelines that are expected to maintain the breathing rate using the 95th percentile breathing rate for children under two years of age and the 80th percentile breathing rate for all other ages. CARB and CAPCOA's Risk Management Guidelines are expected to be approved by the CARB Board in ~~May~~ 2015. The SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212 and the Supplemental Guidelines for Preparing Risk Assessments for AB2588 will also incorporate these modified breathing rates. These modified breathing rates are consistent with CARB's 2003 Interim Risk Management Policy for Residential-Based Cancer Risk that was applied for Health Risk Assessments (HRAs) prepared using OEHHA's 2003 version of its HRA Guidance Manual. This policy recommended that HRAs utilize an 80th percentile breathing rate for inhalation residential cancer risks instead of the 95th percentile recommended in OEHHA's 2003 HRA Guidance Manual. This approach has been used in risk assessments state-wide since that time.

PUBLIC PROCESS AND OUTREACH EFFORTS

At the Governing Board Meeting on May 16, 2014, SCAQMD staff presented *Potential Impacts of the New OEHHA Risk Guidelines on SCAQMD Programs*. The presentation explained that several SCAQMD toxic rules that establish permitting requirements and implement the SCAQMD's Toxics Hot Spots Program, reference the OEHHA's health risk assessment guidelines and that the Revised OEHHA Guidelines would affect these programs. In addition, at the March 6, 2015 Governing Board Meeting, SCAQMD staff presented a Work Plan for implementing the OEHHA's Revised Air Toxics Hot Spots Program Risk Assessment Guidelines. The Work Plan included the following recommendations:

- Implement enhanced outreach and risk communication activities;
- Proceed with development of adjustments to SCAQMD's various programs related to Risk Assessment (Proposed Amended Rules 1401, 1401.1, 1402, and 212); and
- Provide updates to the Stationary Source Committee during rule development process.

Development of PAR 1401, 1401.1, 1402, and 212 is being conducted through a public process. As part of the generalized work plan presented at the March 2015 Governing Board meeting, SCAQMD staff began~~has begun~~ an extensive outreach and communication effort, including mailing 22,000 public workshop notices, to immediately engage all stakeholders regarding the Revised OEHHA Guidelines, including amendments to Rules 212, 1401, 1401.1, and 1402. SCAQMD staff has met~~been meeting~~ with industry groups to discuss the Revised OEHHA Guidelines. As part of the outreach efforts, staff ~~will~~ hosted five regional Public Workshops in March and April of 2015 throughout the Basin. The five public workshops were~~are~~ as follows:

- **March 31, 2015 at 10:00 a.m.**
  Norton Regional Events Center
  Auditorium
  1601 E. 3rd Street, San Bernardino, CA 92408
- **March 31, 2015 at 2:00 p.m.**
  Louis Robidoux Public Library
  Community Room
  5840 Mission Boulevard, Riverside, CA 92509

- **April 1, 2015 at 10:00 a.m.**
  SCAQMD Auditorium
  21865 Copley Drive, Diamond Bar, CA 91765
- **April 2, 2015 at 10:00 a.m.**
  Buena Park Community Center Ballroom
  6688 Beach Boulevard, Buena Park, CA 90621
- **April 2, 2015 at 4:00 p.m.**
  Wilmington Senior Citizen Center
  Community Room
  1371 Eubank Avenue, Wilmington, CA 90744

All responses to comments received at the Public Workshops have~~will~~ been included in Appendix A of this report ~~of the Final Staff Report~~. The SCAQMD also conducted additional workshops to the following business groups requesting further education on the subject rule development and the Revised OEHHA Guidelines:

- Southern California Alliance of Publicly Owned Treatment Works (SCAP)
- San Gabriel Valley Legislative Coalition of Chambers
- California Small Business Alliance
- California Health Care Association
- California Council for Environmental and Economic Balance
- Western States Petroleum Association
- City of Industry Chamber of Commerce
- Greater Riverside Chambers of Commerce
- City of Santa Monica Chamber of Commerce

OEHHA

OEHHA is a state agency under the California Environmental Protection Agency that establishes risk exposure information (i.e., risk values) for toxic air contaminants and is responsible for developing health risk assessment guidance for the state of California. The Scientific Review Panel (SRP) reviews and approves the methodologies used to develop these risk values, thereby finalizing the values for use by state and local agencies in assessing health risks related ~~with~~ to exposure to toxic air contaminants. In addition, AB2588 requires that OEHHA develop health risk assessment guidelines for implementation of the Hot Spots Program (Health and Safety Code Section 44360(b)(2)). In 2003, OEHHA developed and approved the Health Risk Assessment Guidance document (2003 OEHHA Guidelines) supported by Technical Support ~~documents~~ Documents (TSDs) reviewed and approved by OEHHA and the SRP. Since 2003, OEHHA and the SRP developed and approved three additional TSDs: TSD for the Derivation of Noncancer Reference Exposure Levels (2008), TSD for Cancer Potency Factors (2009), and TSD for Exposure Assessment and Stochastic Analysis (2012). The three TSDs provide new scientific information showing that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. As a result, OEHHA developed and adopted the Revised OEHHA Guidelines on March 6, 2015 which incorporate~~s~~ the new scientific information.

TOXIC AIR CONTAMINANTS

A substance is considered toxic if it has the potential to cause adverse health effects in humans. A toxic substance released to the air is considered a toxic air contaminant (TAC) or "air toxic". TACs are identified by state and federal agencies based on a review of available scientific evidence. Federal agencies also use the term hazardous air pollutant.

Exposure to TACs can potentially increase the estimated risk of contracting cancer or result in other adverse health effects. Compounds with cancer risk values (carcinogens) may cause an increase in the probability that an exposed individual would develop cancer. Compounds with non-cancer risk values (chronic and acute) may cause other health effects including nausea or difficulty breathing and may contribute to immunological, neurological, reproductive, developmental, and respiratory problems. Rules 1401, 1401.1, and 1402 are designed to help protect the public from the health risks posed by TACs that are emitted by stationary sources. A health risk assessment is used to estimate the increased probability that an individual would contract cancer or experience other adverse health effects as a result of exposure to listed TACs. TACs are regulated by the SCAQMD based on risk values identified pursuant to the recommendations by OEHHA.

HEALTH RISK ASSESSMENT

A health risk assessment is used to estimate the likelihood that an individual would contract cancer or experience adverse health effects as a result of exposure to TACs. Risk assessment is a methodology for estimating the probability or likelihood that an adverse health effect will occur. OEHHA is the state agency with primary responsibility for developing and recommending risk assessment methods.

Risk assessment consists of four components:

- **Hazard identification**: The evaluation of compounds to determine whether they may cause adverse health effects;
- **Dose-response assessment**: The estimation of the biological response to a given exposure to a compound;
- **Exposure assessment**: The estimation of the level of exposure to a compound; and
- **Risk characterization**: The estimation of the health risk to individuals based on the estimate of exposure and the dose-response relationship.

Hazard identification and dose-response assessments are the responsibility of other regulatory agencies, such as OEHHA. Health risk assessments for particular facilities are conducted by integrating this information with a site-specific exposure assessment to develop an estimate of health risk from the facility's emissions. The latter two elements are conducted or reviewed by the air permitting agencies. To determine the potential health risk, factors such as the emission rate of the TAC, facility location, type of receptor (resident/worker), receptor distance, and meteorology in the area are used. Rule 1401 relies on OEHHA guidelines for calculating toxic risks. These guidelines are incorporated in the SCAQMD's Risk Assessment Procedures for Rule 1401 and 212.

SCAQMD RISK ASSESSMENT PROCEDURES

The SCAQMD staff ~~is preparing~~has prepared revisions to its risk assessment procedures used for permitting and the AB2588 Hot Spots program. Both risk assessment procedures have been based on OEHHA's risk assessment procedures. Revisions to Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and the 2015 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) ~~are~~ were ~~being~~ developed to incorporate the Revised OEHHA Guidelines as well as incorporate CARB's proposed modified breathing rates. Both documents ~~will~~ incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212.

SCAQMD Risk Assessment Procedures for Rules 1401 and 212

The SCAQMD Risk Assessment Procedures for Rules 1401 and 212, Version 7.0 (July 1, 2005) are used by SCAQMD permitting staff and the regulated community to estimate toxic risk from new, relocated, and modified permitted sources. The SCAQMD's Risk Assessment Procedures incorporate OEHHA's previous guidance for determining health risks. The SCAQMD's Risk Assessment Procedures provide four levels of screening risks: Tiers 1, 2, 3, and 4. The tiers are progressively more complex, require increasingly more site-specific details, and give increasingly more refined estimates of risk. Tier 1 uses a table of emission levels for screening based on worst-case assumptions and back-calculating to 1 in one million cancer risk or a hazard index of 1.0, whichever is more stringent. The user determines the emission level for the source and compares it to the table. If it is less than the screening level, no further analysis is needed and no control is required for toxics. Tier 2 provides a formula and the used inputs basic site-specific information to calculate risks. If the source does not pass Tier 2, then dispersion modeling (Tier 3 or Tier 4) can be used to do a more accurate site-specific risk analysis.

The current SCAQMD Risk Assessment Procedures are based on the 2003 OEHHA Guidelines. As a result, the SCAQMD staff is ~~working to update~~has updated these procedures to incorporate the Revised OEHHA Guidance and CARB's proposed modified breathing rates in Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0. In addition to refining Tier screening tables for consistency with the Revised OEHHA Guidelines, additional tables ~~may be~~have been added for specific parameters for select source categories and equipment, including adding modified breathing rates consistent with the California Air Resources Board (CARB) and the California Air Pollution Control Officers Association's (CAPCOA) Risk Management Guidelines for Permitting and AB2588 to the Risk Assessment Procedures, to ensure consistency with the Revised OEHHA Guidelines. The CARB and CAPCOA document is expected to be approved by the CARB Board in ~~May~~ 2015.

Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act

District staff ~~is updating~~has updated its Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588 Supplemental Guidelines) to be consistent with the updated OEHHA Guidelines. Revisions to the AB2588 Supplemental Guidelines include updated SCAQMD-specific guidance on default parameters to use in HARP2 software, default exposure parameters (e.g., breathing rates, exposure durations, etc.), and guidance for dispersion modeling conducted with AERMOD. The AB2588

Supplemental Guidelines ~~will~~ also incorporates the adjusted breathing rates provided in ARB's updated Risk Management Guidance.

Exposure Assessment

The estimated probability of contracting cancer due to exposure to a carcinogen is a function of the dose received, which is based on the airborne concentration of the toxic air contaminant in the vicinity of the source. This is usually estimated through air dispersion modeling. For some TACs, additional receptor exposure can occur due to deposition from the air onto surfaces such as skin, soil, or vegetation, which can then be ingested or otherwise absorbed by the exposed population. These exposures are also quantified. Since exposures to individuals will vary with distance from the source and other factors (such as meteorological or geographical conditions), exposure estimates are calculated for the most exposed individual. Based on the Revised OEHHA Guidelines, this estimate assumes that the potential maximally exposed individual will be exposed continuously for a 30-year lifetime if exposure occurs in a residential area. It should be noted that this is change from the 2003 OEHHA Guidelines assumption of a 70-year lifetime exposure. At commercial and industrial locations, under the Revised OEHHA Guidelines, the exposure duration is a 25 years. The 2003 OEHHA Guidelines assumed a worker exposure of 40 years.

Cancer Risk Characterization

Exposure to TACs can potentially increase the estimated risk of contracting cancer or result in other adverse health effects. Compounds with cancer risk values (carcinogens) may cause an increase in the probability that an exposed individual would develop cancer. Compounds with non-cancer risk values (chronic and acute) may cause other health effects including nausea or difficulty breathing and may contribute to immunological, neurological, reproductive, developmental, and respiratory problems. Rule 1401 is designed to help protect the public from the health risks posed by TACs that are emitted by stationary sources.

Risks from carcinogens are expressed as an added lifetime probability of contracting cancer as a result of a given exposure. For example, if the emissions from a facility are estimated to produce a risk of 1 in one million to the most exposed individual, this means that the individual's chance of contracting cancer has been increased by one chance in one million over and above his or her chance of contracting cancer from all other factors (for example, diet, smoking, heredity and other factors). This added risk to a maximally exposed individual is referred to as a "maximum individual cancer risk" or MICR. In Rule 1401, the risk to the exposed population is also characterized as an estimate of the number of excess cancer cases which may occur in the population as a result of exposure, or "cancer burden." For example, if one million people were subjected to an increased estimated risk of one in one million due to a given exposure, it would be estimated that over a lifetime, one excess cancer case may result in this population from this exposure.

SUMMARY OF SCAQMD RULES 1401, 1401.1, 1402, AND 212

RULE 1401

Rule 1401 – New Source Review for Toxic Air Contaminants was adopted by the SCAQMD Governing Board in June 1990. The rule establishes cancer and non-cancer health risk requirements for new, relocated, or modified permitted sources of toxic air pollutants. Under Rule 1401, new and modified permitted sources cannot exceed an MICR of 1 in one million, if the source is not equipped with best available control technology for toxics (T-BACT). If T-BACT is installed, the MICR cannot exceed 10 in one million. The MICR is the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants. Rule 1401 also has requirements for cancer burden which represents the estimated increase in the occurrence of cancer cases in a given population due to exposure to TACs as well as non-cancer chronic and acute hazard thresholds. Rule 1401 has been amended several times to add or modify new compounds or risk values to the list of TACs as they are identified and risk values are finalized or amended by the state.

RULE 1401.1

Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools was adopted by the SCAQMD Governing Board in November 2005. The rule is designed to be more health protective for school children by establishing more stringent risk requirements related to facility-wide cancer risk and non-cancer acute and chronic HI for new and relocated facilities emitting toxic air contaminants located near schools, thereby reducing the exposure of toxic emissions to school children. For new facilities, the rule requires the facility-wide cancer risk to be less than 1 in one million at any school or school under construction within 500 feet of the facility. If there are no schools within 500 feet, the same risk levels must be met at any school or school under construction within 500 to 1,000 feet unless there is a residential or sensitive receptor within 150 feet of the facility. For relocated facilities, if a facility is relocating, the facility must demonstrate, for each school or school under construction within 500 feet of the facility, that either: 1) the risk at the school from the facility in its new location is no greater than the risk at that same school when the facility was a its previous location, or 2) the facility-wide cancer risk at the school does not exceed 1 in one million. Unlike other SCAQMD risk-based rules, the required risk thresholds of Rule 1401.1 do not change based on whether or not the source is equipped with T-BACT.

RULE 1402

Rule 1402 – Control of Toxic Air Contaminants from Existing Sources was adopted in April 1994. Rule 1402 establishes facility-wide risk requirements for existing facilities that emit TACs and implements the state AB2588 Air Toxics "Hot Spots" program. It contains requirements for toxic emissions inventories, health risk assessments, public notification and risk reduction. A maximum individual cancer risk exceeding 10 in one million, as demonstrated by an approved HRA, triggers the need for public notice. A maximum individual cancer risk of 25 in one million, as demonstrated by an approved HRA, triggers the need for the facility to reduce their facility-wide risk. Any facility whose facility-wide emissions of TACs exceed the significant risk level of 100 in one million is required to achieve risk reductions to achieve a level below 100 in one million within three years from initial risk reduction plan submittal.

RULE 212

Rule 212 – Standards for Approving Permits and Issuing Public Notice was adopted in January 1976 and contains public notification requirements for new, modified, or relocated sources of air contaminants based on proximity to schools, increases to emissions above rule-specified daily maximums, and increases in toxic air contaminant emissions resulting in a MICR of greater than or equal to 10 in one million for single permitted source facilities, or 1 in one million for facilities with more than one permitted source, unless the applicant demonstrates to the satisfaction of the Executive Officer that the total facility-wide cancer risk is below 10 in one million.

CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULES

OVERVIEW

PROPOSED AMENDMENTS TO RULE 1401

PROPOSED AMENDMENTS TO RULE 1401.1

PROPOSED AMENDMENTS TO RULE 1402

PROPOSED AMENDMENTS TO RULE 212

OVERVIEW

The primary purpose of amending Rules 1401, 1401.1, 1402, and 212 is to update rule language relating to cancer risk calculation methodologies so that they are consistent with the Revised OEHHA Guidelines adopted on March 6, 2015.

Proposed Amendments to Rule 1401

Considerations for SCAQMD's permitting approach to implement the Revised OEHHA Guidelines included maintaining public health protection and avoiding backsliding of emission reductions that result in toxic exposure. SCAQMD staff considered if implementation of the guidelines would not unduly impede business activities, and identified approaches to streamline the process to minimize business impacts and SCAQMD resources consistent with principles of transparency and public participation. The proposed amendments to implement the Revised OEHHA Guidelines will be forward-looking. The SCAQMD staff will not retroactively review previously issued permits relative to the Revised OEHHA Guidelines, only permits for new and modified equipment that have been deemed complete 30 days after Proposed Amended Rule 1401 has been adopted. Public notification pursuant to Rule 212 will not be applied retroactively but will apply to new and modified sources.

Proposed Amended Rule 1401 includes a provision to allow spray booths and retail gasoline transfer and dispensing facilities to continue to use the previous OEHHA risk guidelines which are used in SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) to calculate the cancer risk until the SCAQMD staff returns to the Board with specific ~~proposals~~ regulations and/or procedures for these industries. The SCAQMD staff evaluated permits received between October 1, 2009 and October 1, 2014 and found that some spray booths may have difficulties meeting the Rule 1401 risk thresholds using the Revised OEHHA Guidelines. Over the five year permitting period, the SCAQMD received issued approximately 1,400 permits to operate or permits to construct for spray booths. Because of the large number of permits issued and consideration that this particular source category tends to be associated with smaller businesses such as wood coating operations and autobody facilities, SCAQMD staff is recommending that spray booths continue to use the previous health risk guidelines for permitting under Rules 1401. The SCAQMD staff will begin ~~rulemaking~~ to identify regulatory and/or procedural approaches by which industries using spray booths can reduce their toxic emissions and/or toxic exposure.

The SCAQMD staff is also recommending that retail gasoline transfer and dispensing facilities continue to use the previous OEHHA risk guidelines. Based on permitted data, there are approximately 3,300 retail gasoline stations in the district. The SCAQMD receives approximately 15 permit applications annually for new gas stations and 18 permit applications annually for modifications to increase throughput at a gasoline dispensing facilities. The SCAQMD staff just received new emissions data from CARB ~~this month~~in March 2015 that could potentially change the emission estimates from gasoline dispensing facilities. Additional time is needed to better assess and understand the impacts from gasoline dispensing facilities before use of the Revised OEHHA Guidelines. All new gasoline stations are permitted with toxics best available controls and are required to comply with SCAQMD Rule 461 – Gasoline Transfer and Dispensing. PAR 1401 includes a commitment from the Executive Officer to return to the Governing Board as quickly as practicable with Staff's analysis of emissions data from gasoline dispensing activities and applicable regulations and/or procedures.

The definition for "MAXIMUM INDIVIDUAL CANCER RISK (MICR)" in existing Rule 1401 is defined as the estimated probability of a potentially maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants over "a period of 70 years" for residential receptor locations. The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. In order for consistency with the Revised OEHHA Guidelines, paragraph (c)(8) has been amended to omit the assumption of "70 years" and add language that MICR at residential receptor locations be "calculated pursuant to the Risk Assessment Procedures referenced in subdivision (e)" which will be reflected in SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588).

Rule 1401 currently states that Executive Officer shall deny a permit to construct a new, relocated or modified permit unit if emissions of any listed toxic air contaminant occur, unless the applicant substantiates to the satisfaction of the Executive Officer that among other ~~criterion~~criteria, the "Risk Per Year" does not exceed "1/70 of the maximum allowable risk specified in the rule. The calculation for "Risk Per Year" is based on the 2003 OEHHA Guidelines relating to a residential exposure period of 70 years. The "Risk Per Year" requirement of Rule 1401 was established in order to cover specific instances where a permit application was submitted for a piece of equipment that would be in a particular location for a limited number of years, for example, equipment installed for short-term (i.e., 3 to 5 years) such as soil vapor extraction project. SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, which incorporates the Revised OEHHA Guidelines, includes provisions that address short term projects. Therefore the "Risk Per Year" requirement in the rule is~~n~~ no longer necessary and has been removed.~~For consistency with the 30 year exposure period of the Revised OEHHA Guidelines, paragraph (d)(4) has been amended to require that the risk per year shall not exceed the maximum allowable risk specified in the rule divided by the applicable exposure period referenced SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) at any receptor locations in residential areas~~.

PAR 1401 also adds paragraph (g)(5) to allow the equipment category of "spray booths" and the industry category of "retail gasoline transfer and dispensing facilities" to continue using the SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) in order to calculate the cumulative increase in MICR pursuant to paragraph (d)(1).

Proposed Amendments to Rule 1401.1

The definition for "CANCER RISK" in paragraph (c)(1) is defined as the estimated probability of an exposed individual contracting cancer as a result of exposure to toxic air contaminants at a school or school under construction assuming "an exposure duration of 70 years". The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA

Guidelines has been changed from 70 years to 30 years. ~~In order f~~For consistency with the Revised OEHHA Guidelines, paragraph (c)(1) has been amended to omit the assumption of "70 years".

Proposed Amendments to Rule 1402

The definition for "MAXIMUM INDIVIDUAL CANCER RISK (MICR)" in paragraph (c)(9) is defined as the estimated probability of a potentially maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants over "a period of 70 years" for residential receptor locations. The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. ~~In order f~~For consistency with the Revised OEHHA Guidelines, paragraph (c)(8) has been amended to omit the assumption of "70 years" and add language that MICR at residential receptor locations be "calculated pursuant to the Risk Assessment Procedures referenced in subdivision (j)" which will be reflected in SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Amendments have also been made to subparagraphs (j)(1)(C) and (j)(1)(D) to omit references to the "70 year exposure". Other amendments include revisions to Tables I and II to revise emission reporting thresholds for specific TACs and industries for consistency with calculations and methodologies of the Revised OEHHA Guidelines.

Proposed Amendments to Rule 212

Rule 212 requires public notification if any new or modified permit unit results in increases in emission of toxic air contaminants, for which the Executive Officer has made a determination that a person may be exposed to a MICR greater than or equal to 1 in a million for facilities with more than one permitted unit, or greater than or equal to 10 in a million for facilities with a single permitted unit "during a lifetime exposure period of 70 years". The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. ~~In order f~~For consistency with the Revised OEHHA Guidelines, clause (c)(3)(A)(i) and (c)(3)(A)(ii) has omitted the "during a lifetime (70 years)" language from the rule.

CHAPTER 3: IMPACT ASSESSMENT

AFFECTED INDUSTRIES

IMPACT ANALYSIS APPROACH

SOCIOECONOMIC ASSESSMENT

CEQA ANALYSIS

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

COMPARATIVE ANALYSIS

AFFECTED INDUSTRIES

Implementation of Proposed Amended Rules 1401, 1401.1, 1402, and 212 affects many industry categories. As a result, it is challenging to predict the type, number, and size of new and modified sources that will be seeking permit applications. As previously discussed, implementation of the Revised OEHHA Guidelines is expected to increase the estimated inhalation health risk by about 3 times for residential receptors due to the change in calculation methodology. SCAQMD staff conducted an analysis to better understand the potential number of sources that could be affected by the Revised OEHHA Guidelines for permitting new and modified sources (Rule 1401) and facilities under the AB2588 Hot Spots Program (Rule 1402). A discussion of the assumptions and basis for the number of facilities that could potentially require additional pollution controls is discussed below. A summary of the type of pollution controls is provided in Table 3-1 below. Table 3-1 identifies pollution control options, however to reduce toxic emissions an operator could choose other options such as less toxic coatings and solvents, process throughput limits, and distancing sources from receptors.

IMPACT ANALYSIS APPROACH

Rule 1401 and 1401.1 Analysis

To identify new and modified permitted equipment source categories that under Rule 1401 and 1401.1 could potentially need new or additional air pollution controls as a result of using the Revised OEHHA Guidelines, the SCAQMD staff evaluated permits that were issued over a five year period from October 2009 to October 2014. Based on this evaluation, the SCAQMD staff identified three general groups of equipment source categories based on the need for new or additional pollution controls using the Revised OEHHA Guidelines:

1) No new or additional air pollution controls needed:
2) New or additional pollution controls likely needed and/or additional time needed to understand potential impacts; and
3) Potential for new or additional air pollution controls could be required for some permits within an equipment source category.

Under the first group, no new or additional pollution controls are expected using the Revised OEHHA Guidelines because either the cancer risk was well below the Rule 1401 risk thresholds of 1 in one million without T-BACT, and 10 in one million with T-BACT, or there were no toxic emissions associated with the permitted source. Under the second group, SCAQMD staff found two equipment source categories (1) coating and solvents used in spray booths, and (2) retail gasoline dispensing facilities. For coating and solvents used in spray booths, for a percentage of permits reviewed it is likely that new or additional pollution controls would be needed to meet the Rule 1401 cancer risk threshold using the Revised OEHHA Guidelines. For retail gas stations, the SCAQMD staff has received new information from CARB staff regarding the latest speciation of emissions from gasoline dispensing. The SCAQMD staff needs additional time to assess the effects of this information and how it could affect new and modified gasoline dispensing facilities combined with the Revised OEHHA Guidelines. Therefore, Rule 1401 includes a provision to allow these two source categories to continue to use the existing OEHHA Guidelines. The SCAQMD staff will develop source-specific ~~requirements~~ regulations and/or procedures for these source categories to reduce toxic emissions and to address potential permitting issues. For gasoline dispensing facilities, the SCAQMD staff will expedite review of emissions data for gasoline dispensing to better understand potential impacts from gasoline dispensing facilities before using the Revised OEHHA Guidelines.

Lastly under the third group, based on review of five years of permitted data there were five equipment source categories that the estimated cancer risk with the Revised OEHHA Guidelines could require additional controls: metal plating facilities, crematories, plasma arc and laser cutting, wet gate printing and film cleaning, and asphalt and concrete batch blending. Table 3-1 provides a summary for the number of permits annually expected to need additional controls, affected toxic air contaminants, and the possible air pollution control technology for ~~these~~ each of the identified source categories. For plasma arc and laser cutting, most permits are currently close to 1 in one million so it is reasonable to expect for this source category nearly all permits for plasma arc and laser cutting will need additional air pollution controls in order to satisfy T-BACT requirements in Rule 1401, for sources exceeding 1 in a million cancer risk. The SCAQMD staff is working on a rule for metal grinding and cutting that will address emissions from plasma arc and laser cutting. Based on the permitted data, staff estimates that approximately 24 plasma arc and laser cutting permits annually could have estimated health risks greater than 1 in a million requiring pollution additional controls such as a bag house to capture metal particulates. For the remaining equipment or industry categories in Table 3-1, based on the five years of permitted data approximately one permit per year could potentially require additional air pollution controls.

Table 3-1
New or Modified Permits that Potentially Could Require Additional Pollution Controls Using the Revised OEHHA Guidelines[1]

Equipment Category	Number of Permits (Annually)	Toxic Air Contaminants	Typical Control Device
Metal Plating Facilities – Plating Tanks	1	Metal – nickel, hexavalent chromium, cadmium	HEPA filter for nickel or chrome plating tank
Crematory – Furnace	1	Combustion emissions – PAHs	Oxidation catalysts
Plasma Arc and Laser Cutting	24	Nickel and hexavalent chromium emissions	Baghouse for metal particulates
Wet Gate Printing and Film Cleaning (Perc)	1	Perchloroethylene emissions from film cleaning	Carbon adsorber
Asphalt Blending and Concrete Batch (Diesel ICEs)	1	Diesel particulate	Diesel particulate filter on diesel engine

[1] Based on SCAQMD analysis of permits issued between 2009 and 2014.

SCAQMD staff did not include equipment or industry categories that are exempt from Rule 1401 such as emergency internal combustion engines and wood product stripping. SCAQMD staff also did not analyze impacts for permits related to change of ownerships, alterations, or modifications that did not result in an increase in toxic emissions. District Rule 1421 – Control of Perchloroethylene Emissions from Dry Cleaning Systems contain requirements for the phase out of perchloroethylene dry cleaning equipment by 2020 and the state ATCM does not allow purchase of new perchloroethylene dry cleaning equipment. SCAQMD staff did not include the permitting of this equipment category into the impact analysis for this rule development since permitting data shows no permits issued for new perchloroethylene dry cleaning machines over the past five years.

AB2588 Air Toxics Hot Spots Program (Core Facilities) – Rule 1402 Analysis

Since Rule 1402 adoption in 1994, the SCAQMD staff has approved approximately 300 facility HRAs. Based on the most recent approved HRAs for each facility, the SCAQMD staff estimates that 21 facilities could potentially have a cancer risk greater than or equal to 25 in a million when using the Revised OEHHA Guidelines. Under Rule 1402, if the facility-wide health risk is greater than or equal to the action risk level the operator is required to implement risk reduction measures specified in a risk reduction plan to reduce the impact of total facility emissions below the action risk level as quickly as feasible, but by no later than three years. Regarding facilities that are in the AB2588 program, but have not been required to submit an HRA, the SCAQMD staff found that although more facilities will likely be required to submit an HRA, it is not expected that their cancer risk will be over the action risk threshold of 25 in one million. Therefore, no additional pollution controls are assumed for those facilities.

SCAQMD staff evaluated the main toxic driver(s) for the 22 AB2588 facilities that could potentially be required to implement risk reduction measures to make an estimate of the types of additional pollution controls that could potentially be implemented. Rule 1402 establishes a "facility-wide" risk threshold, so there are a variety of options which can be implemented such as process changes, material changes, additional air pollution controls, and reduced throughput. Table 3-2 summarizes the type of facility, key toxic air contaminant that is contributing to the cancer risk, and the type of air pollution controls that could be implemented to reduce the cancer risk.

Table 3-2
Potential Air Pollution Control Device(s)
For Use to Reduce Cancer Risk by AB2588 Facilities

Facility Type	Key Toxic Driver	Air Pollution Control Device(s)
Aerospace	hexavalent chromium, perchloroethylene, tetrachloroethylene	Scrubber/Carbon Adsorber
Aerospace	hexavalent chromium, cadmium	HEPA/Scrubber
Aerospace	perchloroethylene, tetracholorethylene, hexavalent chromium	Carbon Adsorber/HEPA/Scrubber
Aerospace	hexavalent chromium	HEPA/Scrubber
Aerospace	hexavalent chromium	HEPA/Scrubber
Aerospace	lead	HEPA/Scrubber
Asphalt Manufacturer	PAHs, formaldehyde	Scrubber/Carbon Adsorber
Hospital	formaldehyde, PAHs	Thermal oxidizer/Oxidation catalysts
Metal Forging and Heat Treating	nickel	HEPA/Scrubber
Metal Melting	cadmium, lead	HEPA/Scrubber
Metal Melting	cadmium, lead	HEPA/Scrubber
Metal Melting	arsenic, cadmium	Scrubber
Metal Plating and Finishing	hexavalent chromium, nickel, cadmium	HEPA/Scrubber
Metal Plating and Finishing	hexavalent chromium	HEPA/Scrubber
Metal Plating and Finishing	hexavalent chromium	HEPA/Scrubber
Petroleum Refining	1,3-butadiene, hexavalent chromium	Thermal oxidizer/HEPA
Petroleum Refining	diesel particulate matter, 1,3-butadiene (engines)	Diesel particulate filters/Thermal Oxidizer
Petroleum Refining	benzene, PAHs	Thermal oxidizer/Oxidation catalyst
Petroleum Refining	diesel particulate matter (engines), arsenic	Diesel particulate filters/Scrubber
Waste Management	dioxins, furans	Scrubber
Waste Management	formaldehyde	Carbon Adsorber
Waste Management	formaldehyde	Carbon Adsorber

It is assumed that 22 facilities could potentially need to install additional air pollution controls due to the Revised OEHHA Guidelines. This is likely a conservative estimate (meaning there are not likely to be more such facilities) where staff estimated based on previously approved HRAs. It is possible that some facilities could have implemented emission reduction projects that have reduced air toxic emissions and health risks since the HRA was approved.

AB2588 is the state-required Air Toxics Hot Spots Program required by Health and Safety Code §44360(b)(2) which is implemented here in the SCAQMD through Rule 1402. Under the AB2588 program, facilities are divided into four implementation groups. During the "quadrennial" review, AB2588 facilities are required to submit a more detailed emissions inventory for 177 toxic air contaminants. (During the three years between the quadrennial review

AB2588 facilities submit a toxics inventory for 23 toxic air contaminants.) Based on the quadrennial toxics emissions inventory, SCAQMD staff prioritizes facilities and sends a letter to those facilities with a high Priority Score to submit an even more detailed emissions inventory and HRA. Implementing the AB2588 program using the quadrennial review approach provides a more even workflow and reduces the impact on affected facilities to provide a detailed inventory. Implementation of the Revised OEHHA Guidelines will follow the existing quadrennial review process.

The type of control device(s) necessary for implementing risk reduction measures will vary by the pollutant(s) creating the risk. A summary of the type of pollution controls to address the particular TAC is identified in Table 3-2. Possible control options depending on the TAC could be carbon adsorbers, thermal oxidizers, baghouses with high efficiency particulate arrestors (HEPA), diesel particulate filters, and scrubbers. A facility could potentially use one or all of the possible pollution controls depending on the amount of risk reduction needed.

Rule 212 Analysis

Currently, the SCAQMD staff issues approximately five Rule 212 notices annually, on average, for increases in toxic emissions. Rule 212 notices are also issued for increases in criteria pollutant emissions and for projects that are within 1,000 feet of a school. Under Rule 212, a toxics notice is issued if the cancer risk is greater than 1 in a million for facilities with more than one permitted piece of equipment unless the facility-wide cancer risk is less than 10 in a million. A Rule 212 notice is also required if the permitted source is 10 in a million.

SOCIOECONOMIC ASSESSMENT

A socioeconomic assessment for PAR 1401, 1401.1, 1402, and 212 ~~will be~~was conducted and ~~will be~~is available to the public~~ at least 30 days prior to the SCAQMD Governing Board Meeting anticipated for May 1, 2015~~. Compliance costs are analyzed for PAR 1401, 1401.1, 1402, and 212 and the additional pollution control equipment and their permitting costs, submitting or updating HRAs, and the costs of issuing additional public notices. Assuming a 4% real interest rate, the estimated annual cost of compliance is $0.3 million for PAR 1401 and $1.6 million for PAR 1402, for a total overall annual cost of $1.9 million. The compliance costs conservatively assume that previously reported health risks and emission inventories apply today, even though they were reported in the previously approved HRAs and may not reflect the most recent status at the AB2588 facilities. Additional facilities were included where the calculated risks were near rule thresholds and emissions have remained stable or have increased.

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, SCAQMD staff has evaluated the proposed project and is preparing the appropriate CEQA determination. The public workshop meetings ~~will~~ also served to solicit public input on any potential environmental impacts from the proposed project. Comments received at the public workshops on any environmental impacts ~~will be~~were considered when developing the final CEQA document for this rulemaking.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings
California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity
PAR 1401, 1401.1, 1402, and 212 are needed to update rule language relating to risk assessment calculations such that they are consistent ~~to~~ with those specified in the state OEHHA Risk Assessment Guidelines adopted on March 6, 2015.

Authority
The AQMD Governing Board has authority to adopt amendments to Rules 1401, 1401.1, 1402, and 212 pursuant to the California Health and Safety Code Sections 39002, 39650 et. seq., 40000, 40001, 40440, 40441, 40702, 40725 through 40728, 41508, 41700, 41706, 44360 through 44366, and 44390 through 44394.

Clarity
PAR 1401, 1401.1, 1402, and 212 are written or displayed so that its meaning can be easily understood by the persons directly affected by them.

Consistency
PAR 1401, 1401.1, 1402, and 212 are in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication
PAR 1401, 1401.1, 1402, and 212 will not impose the same requirements as any existing state or federal regulations. The proposed amended rules are necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference
By adopting PAR 1401, 1401.1, 1402, and 212, the SCAQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 39666 (District new source review rules for toxics), 41700 (prohibited discharges), 44360 through 44366 (Risk Assessment), and 44390 et seq. (Risk Reduction Audits and Plans).

Rule Adoption Relative to Cost-effectiveness
On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost-effectiveness. The 2012 Air Quality Management Plan (AQMP) ranked, in the order of cost-effectiveness, all of the control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first. PAR 1401, 1401.1, 1402, and 212 are not control measures in the 2012 Air Quality Management Plan (AQMP) and, thus, was not ranked by cost-

effectiveness relative to other AQMP control measures in the 2012 AQMP. In addition, cost-effectiveness defined as cost per ton of emission reductions is not meaningful for toxic risk since risk depends on several factors in addition to emission numbers such as geography, meteorology, and location of receptors.

Incremental Cost-effectiveness

Health and Safety Code Section 40920.6 requires an incremental cost effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SOx, NOx, and their precursors. Since the proposed amended rule applies to toxic air contaminants, the incremental cost effectiveness analysis requirement does not apply.

COMPARATIVE ANALYSIS

Health and Safety Code section 40727.2 requires a comparative analysis of the proposed amended rule with any Federal or District rules and regulations applicable to the same source. See Table 3-3 below.

Table 3-3
Comparative Analysis of PAR 212, 1401, 1401.1 and 1402 with Federal Regulations

Rule Element	PAR 212	PAR 1401	PAR 1401.1	PAR 1402	Equivalent Federal Regulation
Applicability	New or modified permit unit	New, relocated or modified permit unit	New or relocated permit unit	Existing facilities subject to Air Toxics "Hot Spots" Information and Assessment Act of 1987 and facilities with total facility emissions exceeding any significant or action risk level	None
Requirements	Provide public notice to all nearby addresses projects that are located within 1,000 feet of a school, increase risk or nuisance, or increase criteria pollutants above specified thresholds	Limits maximum individual cancer risk, cancer burden and chronic and acute hazards	Limits cancer risk and chronic and acute hazards near schools	Submittal of health risk assessment for total facility emissions when notified. Implement risk reduction measures if facility-wide risk is greater than or equal to action risk level	None
Reporting	Verification that public notice has been distributed	None	None	Progress reports and updates to risk reduction plans	None
Monitoring	None	None	None	None	None
Recordkeeping	None	None	None	None	None

REFERENCES

REFERENCES

"2010 Clean Communities Plan," South Coast Air Quality Management District, November 2010.

"Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments," Office of Environmental Health Hazard Assessment, February 2015.

"Annual Report on AB 2588 Air Toxics "Hot Spots" Program," South Coast Air Quality Management District, June 2014.

"Final Staff Report for Proposed Rule 1402: Control of Toxic Air Contaminants From Existing Sources and Proposed Amended Rule 1401: New Source Review of Toxic Air Contaminants," South Coast Air Quality Management District, February 4, 1994.

"Risk Assessment Procedures for Rules 1401 and 212, Version 7.0," South Coast Air Quality Management District, July 1, 2005

"Staff Report for Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants and 1402 – Control of Toxic Air Contaminants from Existing Sources," South Coast Air Quality Management District, March 2005.

"Staff Report for Proposed Amended Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools," South Coast Air Quality Management District, October 2005.

"The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," Office of Environmental Health Hazard Assessment (OEHHA), March 2015.

APPENDIX A: RESPONSE TO COMMENTS

Response to Comments Received as of March 2015

1. Comment: For nearly 30 years, California businesses have worked with state and local air quality officials to reduce emissions and air toxic risks by 80 percent. OEHHA's latest proposed risk notification guidelines could force local businesses to notify surrounding communities that health risk from their operations is on the rise – even though their facility emissions have stayed the same or even decreased. It is important that the public realize air toxics emissions have not increased; rather, the state has changed the way it estimates air toxics risk. Failure to do so will leave the public with the false impression that air emissions have worsened, when the exact opposite is true.

Response: The SCAQMD staff acknowledges the collective efforts made by state and local air quality agencies and business owners and operators in the Basin to significantly reduce emissions and air toxic risk over the past few decades. Since 1990, toxic risks, excluding diesel particulate have decreased between 75 and 86 percent depending on the location. Staff also understands the concerns of business owners regarding public perception of actual versus estimated health implications resulting from the Revised OEHHA Guidelines. As a result, the staff report has been revised to expand the discussion regarding this concern in Chapter 1 to emphasize the significant decreases in toxic emissions and estimated cancer risks through SCAQMD programs and by businesses in the Basin since 1990. The SCAQMD ~~will also be hosting~~hosted five regional Public Workshops prior to the hearing on the amended rules by the Governing Board as part of an extensive outreach effort to inform business owners and the public of the Revised OEHHA Guidelines and the affected SCAQMD rules and programs. During these workshops, SCAQMD staff ~~will also reiterate~~ reiterated the achievements in actual air toxic emission and estimated cancer risk reductions throughout the Basin, and ~~emphasize~~ emphasized that it is the calculation methodologies to estimate health risks that have changed rather than the levels of emissions.

2. Comment: We urge the SCAQMD to develop and implement reasonable and realistic policies, including both risk communication and risk management guidelines. Risk communication policies must be developed in a way that the public is offered clear and credible explanations of why the health risk assessment guidelines have changed and what the changes really mean in terms of actual health risks.

Response: The proposed amended rules do not change the approach regarding existing health risk thresholds for permitting, public noticing, and risk reduction that facilities have been subject to prior to the adoption of the Revised OEHHA Guidelines. Regarding risk communication, the SCAQMD ~~will be~~ developed~~ing documents or~~ fact sheets explaining the Revised OEHHA Guidelines to include in public notifications that result from implementation of the Revised OEHHA Guidelines. In addition, during the Regional Public Workshops, the presentation included background information about health risks and risk communication based on public input the SCAQMD staff received.

3. Comment: Before adopting your updated AB2588 communications and risk management guidelines, we urge you to listen and work with local business leaders in order to avoid unnecessarily alarming the public while harming local businesses and our economy.

Response: The SCAQMD staff has already begun an extensive outreach and communication effort to immediately engage all stakeholders regarding the Revised OEHHA Guidelines. Staff has met and will continue to meet with industry groups to discuss the implementation of the guidelines to SCAQMD toxic rules and programs. Additionally, five regional Public Workshops were ~~have been~~ ~~scheduled~~ held in March and April of 2015 throughout the Basin in order to inform the public of the Revised OEHHA Guidelines and to receive any comments, questions, or concerns regarding this rule development.

4. Comment: We are concerned that onerous new policies could significantly harm our members' operations or jeopardize their ability to obtain local permits. Our members need reasonable policies that will allow them to operate their business without excessive new costs for risk reduction measures or delaying their permitting renewal process. As such, we urge you to work with local businesses and organizations in developing your risk communications and risk management guidelines.

Response: Staff has conducted an impact analysis based on reviewing permits received over a five year period between 2009 and 2014. Because the majority of permits issued were well under the risk thresholds, even with the Revised Guidelines, the number of new and modified permits that will be affected is not expected to be significant as discussed in Chapter 3. As discussed in the Draft Staff Report, the SCAQMD staff is recommending that spray booths and retail gasoline stations use the current SCAQMD 1401 and 212 Guidelines – Version 7.0 (July 1, 2005) until further analysis can be performed and a determination made as to whether a separate source specific rule or procedures is warranted. Refer to Chapter 3 of the Final Staff Report for a more detailed assessment of impacts to facilities. As also discussed in Chapter 3, the SCAQMD staff does anticipate that there will be some permits that will be affected by the Revised Guidelines based on past permitting data. Based on the five year review of permitted data, the SCAQMD staff estimates about 30 permits a year could require additional controls due to implementation of the Revised OEHHA Guidelines. There are a variety of options that an applicant has in addition to adding pollution controls such as equipment location, product replacement particularly for coatings and solvents, and reduction in throughput. In the Environmental Assessment and Socioeconomic analysis the SCAQMD staff assumed that facilities would install pollution controls. As described in the response to the previous comment, SCAQMD staff is working with all stakeholders on risk communication.

5. Comment: We are concerned about the potential impact these new guidelines will have on projects that already are currently in the pipeline, and urge you to work to adjust the guidelines accordingly to eliminate potentially duplicative effort and costly delays.

Response: The proposed amendments to implement the Revised OEHHA Guidelines will be forward-looking. Under PAR 1401, SCAQMD staff will not retroactively review previously issued permits relative to the Revised OEHHA Guidelines; only permits that are for new and modified equipment that have been deemed complete 30 days after Proposed Amended Rule 1401 has been adopted will be subject to the new Guidelines. Additionally, based on staff analysis of facility impacts, two equipment source categories that have been identified to have potential significant impacts due to the Revised OEHHA Guidelines will be allowed to continue using the 2003 OEHHA Guidelines under PAR 1401 until staff determines the full extent of impacts, if any, and/or source-specific rules are developed for the specified equipment source categories.

6. Comment: California hospitals are in the midst of complying with a $110 billion seismic safety mandate. A number of these hospitals are in your District. While renovating, retrofitting and constructing new buildings, hospitals are replacing old diesel backup generators, boilers, and installing newer and cleaner equipment in conformance with their seismic implementation schedule. At the same time, under state hospital licensing and national accreditation standards, hospitals are required to conduct weekly startups and monthly testing of their generators resulting in the emission of additional diesel particulate matter. As a result, a significant portion of diesel particulate matter generated by hospitals is from meeting requirements mandated by state law and national standards. New risk estimates resulting from changes to air toxics health risk assessment guidelines recently adopted by OEHHA could force hospitals to notify the communities they serve that health risk from their operations is on the rise even though their facility emissions have stayed the same or even decreased. It is our understanding that while hospital diesel particulate emissions have dropped by as much as 80 percent since 1990, the new OEHHA projections may increase the actual cancer risk by 250 to 300 percent.

Response: Emergency diesel generators are exempt from Rule 1401 requirements. However, they are subject to Rule 1470 which requires that new emergency generators at or near a sensitive receptor meet a PM emission rate of between 0.01 and 0.02 grams/BHP-hr for engines greater than 175

BHP. At this low emission rate, these engines are expected to be less than 1 in a million, based on the limited testing hours that are allowed under Rule 1470. Emergency back-up engines are also subject to Rule 212 public noticing, however, it is expected that hospitals will likely be below risk levels for noticing under Rule 212 when meeting the requirements of Rule 1470.

Based on staff's analysis of potential impacts relating to the permitting of boilers, it was found that boilers that are located further than 50 meters from a receptor would not result in an estimated cancer risk of greater than 1 in a million using a Tier 2 screening, and therefore would not have any additional requirements under PAR 1401. Under the SCAQMD's Tier 2 screening, it is expected that some boilers between 25 and 50 meters may need to go to a higher Tier screening level, such a Tier 3 and in some rare situations Tier 4 but these boilers are expected to meet a 1 in a million risk threshold with no additional controls. Health risk screening approaches used in Tier 3 and 4 incorporate more site specific information such as the location of the sensitive receptor, specific stack parameters, and air dispersion modeling specific to the location the inputs for that specific piece of equipment.

The SCAQMD staff will be re-evaluating its public notices to provide additional information to alleviate concerns of potential misconceptions of increased emissions in situations where the change in the estimated risk is attributed solely to the calculation methodology. The SCAQMD will be looking into risk communication tools such as developing documents or fact sheets explaining the Revised OEHHA Guidelines to include in public notifications that result from implementation of the Revised OEHHA Guidelines.

7. Comment: We request that SCAQMD reconsider its preliminary decision to leave unchanged the existing health risk action levels in Rules 1401, 1401.1 and 1402. Both District staff and Board members acknowledged that the expected increase in facility risk estimates are artifacts of OEHHA's changes to state risk assessment methodology, not actual increases in facility air toxics emissions. The risk is spread so far and wide that common activities will create hot spots. The proposal needs much more work including consideration for how it will be implemented and how the District should choose to manage risk thresholds instead of abrogating its risk management authority to OEHHA. For facilities whose air toxics emissions are unchanged or reduced from the most recent District approved air toxics emission inventory, we recommend that the District increase the current action levels to normalize the artificial increase.

Response: SCAQMD staff believes that Rule 1401 and 1402 thresholds are health protective and is recommending maintaining the existing thresholds. While the risk calculation procedure has been revised, the underlying purpose of minimizing the risk to the public remains the same. Rule 1401 acts as gatekeeper for new permits to ensure that excessive new risks are avoided. Similarly, Rule 1402 addresses existing operations to identify and reduce risk. Altering the thresholds would set a precedent for the acceptable risk thresholds for all communities in the South Coast Basin in order to provide some temporary cost reduction relief for a handful of facilities that continue to present the highest risks to their surrounding communities.

As requested, a sensitivity analysis was conducted to evaluate the impacts of alternative risk thresholds. Staff examined the impacts at the alternative Rule 1402 action risk level thresholds of 30 in one million and 20 in one million compared to the existing action risk level of 25 in one million. The table below lists the number of impacted facilities and the estimated cost increase.

Risk Threshold	**20 in one million**	**25 in one million**	**30 in one million**
Additional Facilities Conducting Risk Reduction	28	22	10
Annual Cost	$1.86 million (+26%)	$1.48 million	$1.27 million (-14%)

In estimating the number of facilities that could potentially be subject to risk reduction under the Revised OEHHA Guidelines, the SCAQMD was conservative to include more facilities. For example, facilities whose previously approved Health Risk Assessment could potentially be just under or slightly above 25 in a million were included potentially impacted under the Revised Guidelines and subject to risk reduction. As shown in the table, increasing the risk threshold to 30 in a million would decrease the number of facilities by more than 50 percent, with a modest 14% decrease in cost.

8. Comment: SCAP recommends that facilities be provided with the opportunity to voluntarily commit to an early risk reduction program. Under this proposal, a facility would commit to reducing their facility risk to below 10 in one million and be granted four years to complete associated construction. Additionally, we request that early risk reduction facilities not be subject to notification and that the cost for any necessary permits be significantly reduced and expedited. Such a voluntary program would expedite risk reduction for many more facilities that currently proposed and reduce the burden on District staff.

Response: Staff intends to work closely with facilities committed to early risk reduction. The opportunity to both accelerate risk reductions and have the reductions 60 percent lower than rule requirements is, as the commenter suggests, a win-win proposal. However, state law does not allow for eliminating public notification entirely (Health and Safety Code § 44362(b)). Staff is prepared to look at different notification strategies that fulfill regulatory requirements for public not but focus on explaining facilities commitment to early, enhanced risk reductions. However, staff does not agree that permit fees should be discounted as that would merely transfer the cost of risk reduction from the facility creating the risk to other fee-paying facilities.

9. Comment: Staff noted that a handful of facilities have pending HRAs and will be required to use the revised OEHHA guidelines. Additionally, staff indicated that these facilities would be handled on a case-by-case basis to determine timing and what inventory year should be used. WSPA requests that pending HRAs that were submitted prior to the release of the revised OEHHA Guidelines be allowed to use the existing 2003 OEHHA guidelines, unless the HRAs were not submitted in a timely manner.

Response: The SCAQMD staff is working with affected facilities to update their Health Risk Assessment using the Revised OEHHA Guidelines and doing the work itself rather than requiring the facilities to do so. Staff will use the best and most recent information when conducting risk assessments. Facilities have the opportunity to provide additional supporting information and evidence. However, staff also has the responsibility to ensure that recent information and supporting data is representative of operations over the long term and that review procedures are applied consistently. Staff believes that it is more efficient to update the HRA and understand the overall risks up front, rather than prepare an HRA with the previous OEHHA Guidelines and potentially be asked to prepare another HRA under the Revised OEHHA Guidelines. Also, the SCAQMD staff believes that it streamlines implementation for the facility, particularly if risk reduction is needed such that the facility is not required to conduct notification, and engineering designs, permitting, implementation of controls if risk reduction is needed.

10. Comment: WSPA requests that the District provide four years from an approved HRA to complete risk reduction measures before asking for an updated HRA. This practice would uniformly be applied to all facilities to ensure that there is adequate time for both permitting and implementation.

Response: When requesting an updated HRA, staff takes into account the facility's progress on conducting risk reductions. Generally, an updated HRA is not requested if further risk reductions are imminent.

11. Comment: We understand that although the health risk from emergency diesel ICEs emissions is included in the overall calculation of facility risk, a Board-approved industry-wide policy states that it is not included for purposes of triggering risk reduction or public notification. We requests that staff confirm this interpretation and incorporate this policy into Rule 1402.

Response: Under the current AB2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Regulation, facility operators are required to include health risk impacts of any diesel exhaust particulate emissions from stationary emergency internal combustion engines. The data is used for risk determination but not for risk reduction or notification purposes.

12. Comment: Some facilities with an approved HRA may request an updated prioritization score mid-cycle to determine the impact of the revised OEHHA Guidelines and to potentially implement risk reduction measures prior to submitting an updated HRA or providing public notice. Rule 1402 should clarify that 1) providing an updated prioritization score does not immediately trigger a new request for an HRA, and 2) the facility will remain in their current quadrennial cycle.

Response: Facilities subject to AB2588 are required to submit a detailed list of their toxic emissions every four years (referred to as a quadrennial update). Based on their level of toxic and criteria pollutant emissions, each year a different group of facilities will report a detailed list of its toxic emissions. Upon initial prioritization of facilities, the SCAQMD staff conducts further analyses to verify the Priority Score such as confirming the distance to the sensitive receptors and workers, reviewing emissions trends and facility changes such as new or modified permitted equipment or pollution controls, and comparing the Priority Score results with the last Health Risk Assessment submittal or Risk Reduction Plan, if applicable. This additional information obtained through Priority Score auditing will often negate the need to ask for a Health Risk Assessment. If, however, the Prioritization Score remains high, the facility is asked to prepare an Air Toxics Inventory Report and Health Risk Assessment.

13. Comment: We are concerned that the SCAQMD has not considered the significance thresholds when conducting risk analysis for CEQA determinations. This deferral of CEQA creates some chaos for facilities now in the process of conducting risk analyses for a CEQA determination. Facilities are currently investing significant financial resources and are in the middle of health risk analysis for CEQA determination. Based on the significant impact, we believe that additional time and effort needs to be put into revising the Proposed Amended Rules to address the risk thresholds and improve clarity of implementation for CEQA. Facilities undertaking costly analysis for determinations need this information to adapt in a timely and cost effective manner.

Response: The SCAQMD staff understands your concern. The Proposed Amended Rules are separate from the CEQA significance thresholds. The

SCAQMD staff is currently evaluating how to implement the Revised OEHHA Guidelines under CEQA. The SCAQMD staff will evaluate a variety of options on how to evaluate health risks under the Revised OEHHA Guidelines under CEQA. The SCAQMD staff will conduct public workshops to gather input before bringing recommendations to the Governing Board. In the interim, staff will continue to use the previous guidelines for CEQA determinations.

ATTACHMENT H

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Environmental Assessment for:

PROPOSED AMENDED RULES TO IMPLEMENT OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT (OEHHA) REVISIONS TO THE AIR TOXICS HOT SPOTS PROGRAM RISK ASSESSMENT GUIDELINES

May 2015

SCAQMD No. 150324CC

Executive Officer
Barry R. Wallerstein, D. Env.

Deputy Executive Officer
Planning, Rule Development and Area Sources
Philip M. Fine, Ph.D.

Assistant Deputy Executive Officer
Planning, Rule Development and Area Sources
Jill Whynot

Director of Strategic Initiatives
Planning, Rule Development and Area Sources
Susan Nakamura

Author:	Cynthia A. Carter	Air Quality Specialist
Technical Assistance:	Michael Morris	Program Supervisor
	Eugene Kang	Program Supervisor
Reviewed By:	Michael Krause	CEQA Program Supervisor
	Barbara Baird	Chief Deputy Counsel
	William Wong	Principal Deputy District Counsel

TABLE OF CONTENTS

CHAPTER 1 I

INTRODUCTION 1-1
PROPOSED AMENDMENTS TO RULES 212, 1401, 1401.1, AND 1402 1-1
LEGISLATIVE AUTHORITY 1-2
CALIFORNIA ENVIRONMENTAL QUALITY ACT 1-2
PROJECT LOCATION 1-3
PROJECT OBJECTIVES 1-5
PROJECT BACKGROUND 1-5
PROJECT DESCRIPTION 1-7
EMISSIONS CONTROL TECHNOLOGIES FOR TOXICS 1-10

CHAPTER 2 I

INTRODUCTION 2-2
GENERAL INFORMATION 2-2
ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED 2-3
DETERMINATION 2-4
DISCUSSION AND EVALUATION OF ENVIRONMENTAL IMPACTS 2-5
ENVIRONMENTAL CHECKLIST AND DISCUSSION 2-10
I. AESTHETICS. 2-11
II. AGRICULTURE AND FOREST RESOURCES. 2-12
III. AIR QUALITY AND GREENHOUSE GAS EMISSIONS 2-14
IV. BIOLOGICAL RESOURCES. 2-26
V. CULTURAL RESOURCES. 2-28
VI. ENERGY. 2-30
VII. GEOLOGY AND SOILS. 2-33
VIII. HAZARDS AND HAZARDOUS MATERIALS. 2-36
IX. HYDROLOGY AND WATER QUALITY. 2-41
X. LAND USE AND PLANNING. 2-46
XI. MINERAL RESOURCES. 2-47
XII. NOISE. 2-48
XIII. POPULATION AND HOUSING. 2-50
XIV. PUBLIC SERVICES. 2-51
XV. RECREATION. 2-53
XVI. SOLID/HAZARDOUS WASTE. 2-54
XVII. TRANSPORTATION/TRAFFIC. 2-57
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE. 2-60

APPENDICES 2-62

APPENDIX A PROPOSED AMENDED RULES I
APPENDIX B CALCULATIONS I

List of Tables

Table 1-1 Filtration Controls for T-Particulate Matter and T-Aerosols 1-12
Table 1-2 Controls for T-VOC and Halogenated T-VOC 1-14
Table 1-3 Thermal and Catalytic Controls for T-VOC.. 1-14
Table 2-1 PAR 1401 New or Modified Permits that Potentially Could Require Additional Pollution Controls Using the Revised OEHHA Guidelines 2-6
Table 2-2 PAR 1402 Potential Air Pollution Control Device(s) For Use to Reduce Cancer Risk by AB2588 Facilities 2-7
Table 2-3 Summary of Types of APCD's to be Installed at Estimated Affected Facilities and Analyzed for Impacts... 2-9
Table 2-4 SCAQMD Air Quality Significance Thresholds.. 2-15
Table 2-5 PARs Daily Peak Construction Emissions in SCAQMD for Two Facilities 2-18
Table 2-6 Estimated Operational Emissions from Thermal Oxidizers..................................... 2-20
Table 2-7 Estimated Operational Emissions from Regenerating Spent Carbon........................ 2-21
Table 2-8 SCAQMD Operational Criteria Pollutant Emissions... 2-21
Table 2-9 Total Projected Fuel Usage for Construction Activities... 2-31
Table 2-10 Total Projected Natural Gas Usage for Thermal Oxidizer Operations.................... 2-32
Table 2-11 PARs Additional Electricity Consumption 2-32
Table 2-12 Wastewater Discharge Volumes/Freshwater Demand From Carbon Adsorption and Wet Scrubbing 2-43
Table 2-13 Estimates of Solid Waste from Carbon Adsorption 2-55
Table 2-14 Total Solid Waste Generation 2-56
Table 2-15 Estimation of Vehicle Trips.. 2-59

List of Figures

Figure 1-1 Boundaries of the South Coast Air Quality Management District............................ 1-4

PREFACE

This document constitutes the Final Environmental Assessment (EA) for Proposed Amended Rule (PAR) 212 – Standards for Approving Permits and Issuing Public Notice, PAR 1401 – New Source Review of Toxic Air Contaminants, PAR 1401.1 Requirements for New and Relocated Facilities Near Schools, and PAR 1402 – Control of Toxic Air Contaminants from Existing Sources. The Draft EA was released for a 30-day public review and comment period from March 24 to April 22, 2015. No comment letters were received from the public relative to the environmental analysis in the Draft EA. The environmental analysis in the Draft EA concluded that the proposed project would not generate adverse significant environmental impacts.

Subsequent to the release of the Draft EA, minor additions and modifications were made to the PARs for clarification purposes. The latest versions of the PARs can be found in the Governing Board's final rule package. To facilitate identifying the modifications in the document, changes are included as <u>underlined</u> text and text removed from the document are indicated by ~~strikethrough~~. None of the modifications alter any conclusions reached in the Draft EA. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15073.5. Therefore, this document now constitutes the Final EA for the PARs.

CHAPTER 1

P R O J E C T   D E S C R I P T I O N

Introduction

Proposed Amendments to Rules 212, 1401, 1401.1 and 1402

Legislative Authority

California Environmental Quality Act

Project Location

Project Objectives

Project Background

Summary of Rules 212, 1401, 1401.1 and 1402

Project Description

Emission Control Technologies for Toxics

INTRODUCTION

On March 6, 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) approved revisions to their Risk Assessment Guidelines (Revised OEHHA Guidelines). The Revised OEHHA Guidelines were triggered by the passage of the Children's Health Protection Act of 1999 (SB 25, Escutia) requiring OEHHA to ensure infants and children are explicitly addressed in assessing risk. Over the past decade, advances in science have shown that early-life exposures to air toxics contribute to an increased lifetime risk of developing cancer, or other adverse health effects, compared to exposures that occur in adulthood[1]. The new risk assessment methodology addresses this greater sensitivity and incorporates the most recent data on infants and childhood and adult exposure to air toxics. The Revised OEHHA Guidelines incorporates age sensitivity factors which will increase cancer risk estimates to residential and sensitive receptors by approximately 3 times, and more than 3 times in some cases depending on whether the toxic air contaminant has multiple pathways of exposure in addition to inhalation. Health risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged.

PROPOSED AMENDMENTS TO RULES 212, 1401, 1401.1, AND 1402

The SCAQMD relies on OEHHA's health risk assessment guidelines in various aspects of its toxics regulatory program including the permitting program, AB2588 Hot Spots Program, and existing regulatory program. Amendments to the following rules are being proposed to incorporate provisions found in the Revised OEHHA Guidelines for estimation of health risks:

- Rule 212 – Standards for Approving Permits and Issuing Public Notice
- Rule 1401 – New Source Review of Toxic Air Contaminants
- Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools
- Rule 1402 – Control of Toxic Air Contaminants from Existing Sources

The proposed amended rules will revise definitions and risk assessment procedures to be consistent with the Revised OEHHA Guidelines. Proposed amendments are to ensure SCAQMD staff can implement the Revised OEHHA Guidelines regarding how health risks are calculated. Staff is not recommending revisions to the health risk *thresholds* in Rules 1401, 1401.1 or 1402. Staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). For two specific industries, gas stations and spray booths, staff requires additional time to evaluate the impacts of the revised OEHHA Guidelines or believes that additional controls will be required that may not be feasible. For these source categories, staff proposes to continue using the existing risk assessment guidelines until staff can perform the required analysis and develop a source-specific risk reduction rule if needed. Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 212, 1401, 1401.1, and 1402.

[1] A toxic substance released to the air is called a "toxic air contaminant" (TAC) or an "air toxic." A substance is considered toxic if it has the potential to cause adverse health effects. Exposure to a toxic substance can increase the risk of contracting cancer or produce other adverse health effects such as birth defects and other reproductive damage, neurological and respiratory health effects.

The California Air Resources Board (CARB) and the California Air Pollution Control Officers Association's (CAPCOA) are finalizing Risk Management Guidelines for Permitting and AB2588 to be consistent with the Revised OEHHA Guidelines that are expected to recommend the using the 95^{th} percentile breathing rate for children under two years of age to the last trimester of pregnancy and the 80^{th} percentile breathing rate for all other ages. CARB and CAPCOAs Risk Management Guidelines are expected to be considered by the CARB Board in May 2015. The SCAQMD's Risk Assessment Procedures for Rules 212, 1401, and 1401.1 the Supplemental Guidelines for Preparing Risk Assessments for AB2588 will also incorporate these modified breathing rates.

LEGISLATIVE AUTHORITY

The California Legislature created the SCAQMD in 1977 (Lewis-Presley Air Quality Management Act, California Health and Safety Code §§ 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations in the Basin and portions of the Salton Sea Air Basin and Mojave Desert Air Basin. By statute, SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all state and federal ambient air quality standards for the District [California Health and Safety Code §40460(a)]. Furthermore, SCAQMD must adopt rules and regulations that carry out the AQMP [California Health and Safety Code, §40440(a)].

In addition to regulating criteria pollutants, state law specifies that air districts may regulate TACs. Specifically, Health and Safety Code §39656, California legislature has delegated the air districts, including the SCAQMD, to establish and implement a program to regulate TACs. Similarly, SCAQMD implements the Air Toxics Hot Spots Act (Health and Safety Code §44330) through Rule 1402.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PAR 212, 1401, 1401.1, and 1402 affect new and modified permitted equipment and existing facilities and taken as a whole, a discretionary action, which has the potential to result in direct or indirect changes to the environment and, therefore, is considered a "project" (hereinafter referred to as "*The PARs*") as defined by the California Environmental Quality Act (CEQA). There are no expected environmental impacts from Proposed Amended Rules 212 or 1401.1 as a result of the revised OEHHA guidelines because changes to these rules are administrative in nature and do not require or cause a physical damage to the environment. SCAQMD is the lead agency for the proposed project and has prepared this Draft Environmental Assessment (EA) pursuant to its Certified Regulatory Program (CEQA Guidelines § 15251). This Draft EA is a comprehensive environmental document that analyzes potential adverse environmental impacts from the currently proposed amendments to Rules 1401 and 1402. California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report or negative declaration once the Secretary of the Resources Agency has certified the regulatory program. SCAQMD's regulatory program was certified by the Secretary of the Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110.

CEQA and SCAQMD Rule 110 require that potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of

CEQA, this Draft EA addresses the potential adverse environmental impacts associated with the proposed project according to CEQA Guidelines § 15252. It states that the lead agency has an obligation to identify and evaluate the environmental effects of the project. The Draft EA is an informational document intended to: (a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental effects of the proposed project; and, (b) identify possible ways to minimize the significant effects.

SCAQMD's review of the proposed project shows that the proposed project is not expected to generate significant adverse affects on the environment. Pursuant to CEQA Guidelines §§ 15126.4 (a)(3), and 15126.6, mitigation measures and alternatives are not required for effects which are not found to be significant, thus, no mitigation measures or alternatives to the project are included in the draft SEA. In addition, because SCAQMD has a certified regulatory program, the Environmental Assessment is an appropriate substitute for an EIR or Negative Declaration. Pursuant to CEQA Guidelines § 15252(a)(2)(B) and supported by the environmental checklist (in Chapter 2), if the project would not have any significant or potentially significant effect on the environment, "no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment." ~~Comments received on the Draft EA during the 30-day public review period will be addressed and included in the Final EA.~~ The Draft EA was released for a 30-day public review and comment period from March 24, 2015 to April 22, 2015. No comment letters were received on the Draft EA during the comment period.

PROJECT LOCATION

The proposed amendments would apply to equipment and processes operated at toxic emitting facilities located throughout the entire SCAQMD jurisdiction. The SCAQMD has jurisdiction over an area of 10,473 square miles (referred to hereafter as the district), consisting of the four-county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (see Figure 1-1).

Figure 1-1 Boundaries of the South Coast Air Quality Management District

PROJECT OBJECTIVES

The primary purpose of amending Rules 212, 1401, 1401.1, and 1402 is to update rule language relating to cancer risk calculation methodologies so that is consistent with the Revised OEHHA Guidelines approved by OEHHA on March 6, 2015.

PROJECT BACKGROUND

The SCAQMD has a robust and comprehensive air toxics regulatory program that consists of rules to address new and modified toxic sources, AB2588 facilities (existing toxic sources), and source-specific toxic rules. Rules 1401, 1401.1, and 1402 are referred to as the "umbrella" rules that specify requirements for all new and modified permitted sources (Rules 1401 and 1401.1 for sources near schools) and requirements for the existing sources under the Air Toxics Hot Spots program (Rule 1402). In addition to these umbrella toxics rules, the SCAQMD's regulatory program includes over fifteen source-specific toxic rules regulating specific equipment or industry categories such as chrome plating, asbestos remediation, lead emission reductions, percholoroethylene dry cleaners, diesel internal combustion engines to name a few. Implementation of these programs has resulted in significant reductions in toxic emissions. Since the development of SCAQMD's Air Toxics Program in 1990, non-diesel cancer risks have been reduced between 75 to 87 percent, depending on the location within the Basin.

SUMMARY OF SCAQMD RULES 212, 1401, 1401.1, AND 1402

RULE 212

Rule 212 – Standards for Approving Permits and Issuing Public Notice was initially adopted in January 1976 and contains public notification requirements for new, modified, or relocated sources of air contaminants based on proximity to schools, increases to emissions above rule-specified daily maximums, and increases in toxic air contaminant emissions resulting in a MICR of greater than or equal to 10 in one million for single permitted source facilities, or 1 in one million for facilities with more than one permitted source, unless the applicant demonstrates to the satisfaction of the Executive Officer that the total facility-wide cancer risk is below 10 in one million.

RULE 1401

Rule 1401 – New Source Review for Toxic Air Contaminants was adopted by the SCAQMD Governing Board in June 1990. The rule establishes cancer and non-cancer health risk requirements for new, relocated, or modified permitted sources of toxic air pollutants. Under Rule 1401, new and modified permitted sources cannot exceed an MICR of 1 in one million, if the source is not equipped with best available control technology for toxics (T-BACT). If T-BACT is installed, the MICR cannot exceed 10 in one million. The MICR is the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants. Rule 1401 also has requirements for cancer burden which represents the estimated increase in the occurrence of cancer cases in a given population due to exposure to TACs. The rule also includes non-cancer chronic and acute hazard thresholds. Rule 1401 has been amended several times to add or modify new compounds or risk values to the list of TACs as they are identified and risk values are finalized or amended by the state.

RULE 1401.1

Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools was adopted by the SCAQMD Governing Board in November 2005. The rule is designed to be more health protective for school children by establishing more stringent risk requirements related to facility-wide cancer risk and non-cancer acute and chronic HI for new and relocated facilities emitting toxic air contaminants located near schools, thereby reducing the exposure of toxic emissions to school children. For new facilities, the rule requires the facility-wide cancer risk to be less than 1 in one million at any school or school under construction within 500 feet of the facility. If there are no schools within 500 feet, the same risk levels must be met at any school or school under construction within 500 to 1,000 feet unless there is a residential or sensitive receptor within 150 feet of the facility. For relocated facilities, if a facility is relocating, the facility must demonstrate, for each school or school under construction within 500 feet of the facility, that either: 1) the risk at the school from the facility in its new location is no greater than the risk at that same school when the facility was a its previous location, or 2) the facility-wide cancer risk at the school do not exceed 1 in one million. Unlike other SCAQMD risk-based rules, the required risk thresholds of Rule 1401.1 do not change based on whether or not the source is equipped with T-BACT.

RULE 1402

Rule 1402 – Control of Toxic Air Contaminants from Existing Sources was adopted in April 1994. Rule 1402 establishes facility-wide risk requirements for existing facilities that emit TACs and implements the state AB2588 Air Toxics "Hot Spots" program. It contains requirements for toxic emissions inventories, health risk assessments, public notification and risk reduction. A maximum individual cancer risk exceeding 10 in one million, as demonstrated by an approved HRA, triggers the need for public notice. A maximum individual cancer risk of 25 in one million, as demonstrated by an approved HRA, triggers the need for the facility to reduce their facility-wide risk. Any facility whose facility-wide emissions of TACs exceed the significant risk level of 100 in one million is required to achieve risk reductions to achieve a level below 100 in a million within three years from initial risk reduction plan submittal.

PROJECT DESCRIPTION

The SCAQMD relies on OEHHA's health risk assessment guidelines in various aspects of its toxics regulatory program including the permitting program, AB2588 Hot Spots Program, and existing regulatory program. Amendments to the following rules are being proposed to reference the Revised OEHHA Guidelines for estimation health risks:

- Rule 212 – Standards for Approving Permits and Issuing Public Notice
- Rule 1401 – New Source Review of Toxic Air Contaminants;
- Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools;
- Rule 1402 – Control of Toxic Air Contaminants from Existing Sources; and

The proposed amended rules will revise definitions and risk assessment procedures to be consistent with the Revised OEHHA Guidelines. Proposed amendments are to ensure SCAQMD staff can implement the Revised OEHHA Guidelines regarding how health risks are calculated, and staff is not recommending revisions to the health risk thresholds in Rules 1401, 1401.1 or 1402. The SCAQMD staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and the 2015 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212.

The California Air Resources Board (CARB) and the California Air Pollution Control Officers Association's (CAPCOA) are finalizing Risk Management Guidelines for Permitting and AB2588 to be consistent with the Revised OEHHA Guidelines that are expected to maintain the breathing rate using the 95th percentile breathing rate for children under two years of age and the 80th percentile breathing rate for all other ages. CARB and CAPCOAs Risk Management Guidelines are expected to be approved in May 2015. The SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212 and the Supplemental Guidelines for Preparing Risk Assessments for AB2588 will also incorporate these modified breathing rates. These modified breathing rates are consistent with CARB's 2003 Interim Risk Management Policy for Residential-Based Cancer Risk that was applied for Health Risk Assessments (HRAs) prepared using OEHHA's 2003 version of its HRA Guidance Manual. This policy recommended that HRAs utilize an 80th percentile breathing rate for inhalation residential cancer risks instead of the 95th percentile recommended in OEHHA's 2003 HRA Guidance Manual. This approach has been used in risk assessments state-wide since that time.

Proposed Amendments to Rule 212

Rule 212 requires public notification if any new or modified permit unit results in increases in emission of toxic air contaminants, for which the Executive Officer has made a determination that a person may be exposed to a MICR greater than or equal to 1 in a million for facilities with more than one permitted unit, or greater than or equal to 10 in a million for facilities with a single permitted unit "during a lifetime exposure period of 70 years". The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. In order for consistency with the Revised OEHHA Guidelines, clause (c)(3)(A)(i) and (c)(3)(A)(ii) has omitted the "during a lifetime (70 years)" language from the rule and replaced with a reference to Rule 1401 requirements.

Proposed Amendments to Rule 1401

Considerations for SCAQMD's permitting approach to implement the Revised OEHHA Guidelines included maintaining public health protection and avoiding backsliding of emission reductions that result in toxic exposure. SCAQMD staff considered if implementation of the guidelines would not unduly impede business activities, and identified approaches to streamline the process to minimize business impacts and SCAQMD resources consistent with principles of transparency and public participation. The proposed amendments to implement the Revised OEHHA Guidelines will be forward-looking. The SCAQMD staff will not retroactively review previously issued permits relative to the Revised OEHHA Guidelines only permits that are new and modified that have been deemed complete after Rule 1401 has been adopted. Public notification pursuant to Rule 212 will not be applied retroactively but will apply to new and modified sources.

Proposed Amended Rule 1401 includes a provision to allow spray booths and retail gasoline transfer and dispensing facilities to continue to use the previous OEHHA risk guidelines which are used in SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) to calculate the cancer risk until the SCAQMD staff returns to the Board with specific proposals for these industries. The SCAQMD staff evaluated permits received between October 1, 2009 and October 1, 2014 and found that some spray booths may have difficulties meeting the Rule 1401 risk thresholds using the Revised OEHHA Guidelines. Over the five year permitting period, the SCAQMD received issued approximately 1,400 permits to operate or permits to construct for spray booths. Because of the large number of permits issued and consideration that this particular source category tends to be associated with smaller businesses such as wood coating operations and autobody facilities, SCAQMD staff is recommending that spray booths continue to use the previous health risk guidelines for permitting under Rules 1401. The SCAQMD staff will begin rulemaking to identify approaches by which industries using spray booths can reduce their toxic emissions and/or toxic exposure.

The SCAQMD staff is also recommending that retail gasoline transfer and dispensing facilities continue to use the previous OEHHA risk guidelines. Based on permitted data, there are approximately 3,300 retail gasoline stations in the district. The SCAQMD receives approximately 15 permit applications annually for new gas stations and 18 permit applications annually for modifications to increase throughput at a gasoline dispensing facilities. The SCAQMD staff just received new emissions data from CARB this month that could potentially change the emission estimates from gasoline dispensing facilities. Additional time is needed to better assess and understand the impacts from gasoline dispensing facilities before use of the Revised OEHHA Guidelines. All new gasoline stations are permitted with toxics best available controls and are required to comply with SCAQMD Rule 461 – Gasoline Transfer and Dispensing. PAR 1402 includes a commitment from the Executive Officer to return to the Governing Board as quickly as practicable with Staff's analysis of emissions data from gasoline dispensing activities.

The definition for "MAXIMUM INDIVIDUAL CANCER RISK (MICR)" in existing Rule 1401 is defined as the estimated probability of a potentially maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants over "a period of 70 years" for residential receptor locations. The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. In order for consistency with the Revised OEHHA Guidelines, paragraph (c)(8) has been amended to omit the assumption of "70 years" and add language that MICR at residential receptor locations be "calculated pursuant to the Risk Assessment Procedures referenced in subdivision (e)" which will be reflected in SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588).

Rule 1401 currently states that Executive Officer shall deny a permit to construct a new, relocated or modified permit unit if emissions of any listed toxic air contaminant occur, unless the applicant substantiates to the satisfaction of the Executive Officer that among other criterion, the "Risk Per Year" does not exceed "1/70 of the maximum allowable risk specified in the rule. The calculation for "Risk Per Year" is based on the 2003 OEHHA Guidelines relating to a residential exposure period of 70 years. For consistency with the 30 year exposure period of the Revised OEHHA Guidelines, paragraph (d)(4) has been amended to require that the risk per year shall not exceed the maximum allowable risk specified in the rule divided by the applicable exposure period referenced SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) at any receptor locations in residential areas.

PAR 1401 also adds paragraph (g)(5) to allow the equipment category of "spray booths" and the industry category of "retail gasoline transfer and dispensing facilities" to continue using the current SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) in order to calculate the cumulative increase in MICR pursuant to paragraph (d)(1).

Proposed Amendments to Rule 1401.1

The definition for "CANCER RISK" in paragraph (c)(1) is defined as the estimated probability of an exposed individual contracting cancer as a result of exposure to toxic air contaminants at a school or school under construction assuming "an exposure duration of 70 years". The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. In order for consistency with the Revised OEHHA Guidelines, paragraph (c)(1) has been amended to omit the assumption of "70 years" and replaced with a reference to Rule 1401 requirements.

Proposed Amendments to Rule 1402

The definition for "MAXIMUM INDIVIDUAL CANCER RISK (MICR)" in paragraph (c)(9) is defined as the estimated probability of a potentially maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants over "a period of 70 years" for residential receptor locations. The assumption for lifetime exposure relating to a residential receptor in the Revised OEHHA Guidelines has been changed from 70 years to 30 years. In order for consistency with the Revised OEHHA Guidelines, paragraph (c)(8) has been amended to omit the assumption of "70 years" and add language that MICR at residential receptor locations be "calculated pursuant to the Risk Assessment Procedures referenced in subdivision (j)" which will be reflected in SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Amendments have also been made to subparagraphs (j)(1)(C) and (j)(1)(D) to omit references to the "70 year exposure". Other amendments include revisions to Tables I and II to revise emission reporting thresholds for specific TACs and industries for consistency with calculations and methodologies of the Revised OEHHA Guidelines.

EMISSIONS CONTROL TECHNOLOGIES FOR TOXICS

To comply with the risk limits, certain existing sources, using the new OEHHA Guidelines which have been identified as potentially exceeding the significant risk levels in Rule 1401 and Rule 1402, may need to implement risk reduction measures that include the following:

- Product reformulation and substitution
- Production system modifications, operational standards or practices modifications
- System enclosure and emission capture, exhaust, control or conversion
- Alternative technologies

Several of these risk reduction measures are facility specific (i.e., operational standards and reduction in operating hours).

The use of the most appropriate control technologies is dependent on:

- the physical characteristics and chemical properties of the regulated substances;
- the concentration of the regulated substance;
- design parameters such as the exhaust flow rate, temperature, and pressure of the air to be controlled; and
- the removal and destruction efficiency of the collection and control equipment needed to comply with the requirements of the appropriate rule.

In order to determine which control technology will be used to control a specific TAC, the regulated TACs were categorized by physical and/or chemical properties. Generally, the TACs comprise the following general categories and sub-categories.

- Toxic inorganic aerosols and particulate matter (T-PM)
    - ✓ Metal particles
    - ✓ Mineral/fiber particles
    - ✓ Inorganic acid aerosols
- Toxic volatile organic compounds (VOC)
    - ✓ High boiling point (>150°C)
    - ✓ Medium boiling point (100 - 150°C)

- ✓ Low boiling point (<100^{o}C)
- ✓ Polar organic compounds
- ✓ Nonpolar organic compounds
- ✓ Aromatic compounds
- ✓ Carbonyls

- Toxic halogenated organic compounds (T-HOC)
  - ✓ Fluorinated compounds
  - ✓ Chlorinated compounds
  - ✓ Brominated compounds
  - ✓ Dioxins and furans

Control technologies that can be applied to control TACs generally are categorized into the following groups:

- Filtration for toxic aerosols and particulate matter (T-PM)
- Wet scrubbing for inorganic compounds
- Thermal and catalytic oxidation
- Refrigerated condensation
- Carbon adsorption and combined adsorption-oxidation systems
- Chemical absorption for toxic volatile organic compounds (VOC)
- Special combination systems for the control of toxic halogenated organic compounds (T-HOC).

A description of available control technologies expected to be used by affected facilities to comply with proposed amended Rule 1401 and/or1402 is provided in the following section.

Control Technology for Toxic Aerosols and Particulate Matter (T-PM)
Table 1-1 identifies typical filtration control equipment for T-PM. Filtration control techniques are characterized by high removal efficiency and moderate- to high-energy requirements in most applications. In order to achieve high removal efficiencies, dry filters must be made of extremely low porosity materials which impose a high resistance to the flow of gas, or pressure drop (expressed in inches of water column where one inch of water column equals 0.43 pounds per square inch absolute) through the filter media. The higher the pressure drop across a control device, the higher the electrical energy requirement to operate larger fan motors needed to

overcome the flow resistance. Therefore, high-efficiency controls are also high-energy controls with correspondingly high operating costs.

Table 1-1 Filtration Controls for T-Particulate Matter and T-Aerosols

CONTROL TECHNOLOGY	SUBSTANCE GROUP	CONTROL EFFICIENCY
Diesel Particulate Filters	Dry particulate	85%
PTFE membrane baghouse	Dry particulate	99-99.9 %
HEPA filter and prefilter	Dry particulate	99.9-99.99 %
Wet packed scrubber	Aerosols	90-98 %

Diesel Particulate Filters (DPFs)

DPFs allow exhaust gases to pass through the filter medium, but trap diesel PM. Depending on engine baseline emissions, fuel sulfur content, and emission test method or duty cycle, DPF's can achieve a PM emission reduction of greater than 85 percent. In addition, DPFs can reduce HC emissions by 95 percent and CO emissions by 90 percent. Limited test data indicate that DPFs can also reduce NOx emissions by six to ten percent. Most DPFs require periodic regeneration, most commonly achieved by burning off accumulated diesel PM. There are both active DPFs and passive DPFs. Active DPFs use heat generated by means other than exhaust gases (e.g., electricity, fuel burners, microwaves, and additional fuel injection to increase exhaust gas temperatures) to assist in the regeneration process. Passive DPFs, which do not require an external heat source to regenerate, incorporate a catalytic material, typically a platinum group metal, to assist in oxidizing trapped diesel PM. Although there is a slight increase in directly emitted NO_2 during the regeneration of passive DPFs, overall there is ultimately a net reduction in NO_2 emissions.

Polytetrafluoroethylene Membrane Baghouse

Baghouses remove particulate matter from gas streams in the same manner as a household vacuum cleaner bag, using the principle of aerodynamic capture by fibers. In lieu of conventional natural or synthetic bag fabrics such as cotton or Nomex, polytetrafluoroethylene (PTFE, trade name Gore-Tex) fabric consists of a very thin laminate of microporous Teflon on a suitable substrate. PTFE bags are capable of a particulate collection efficiency of 99 to 99.9 percent for particle sizes down to 1.0 micron (µm) when properly operated and maintained. Because of the microporous nature of PTFE, air-to-cloth ratios for these applications are lower than with conventional fabrics, requiring more collector area for a given volume flow rate of gas at a higher relative pressure drop. PTFE can tolerate moderately high temperatures (400^{o}F) at the expense of shortened bag life. The current trend in bag cleaning is the pulsejet technology, where tubular bags are supported from the inside by metal wire frames. Gas flows across the fabric from the outside inward, exiting at the top of the bags. Periodically, a blast of compressed air from a fixed nozzle located inside the wire frame causes the bag to inflate outward, thus knocking the accumulated toxics-bearing dust off the bag exterior and into the baghouse hopper, ready for collection and disposal as dry potentially hazardous solid waste.

High-efficiency Particulate Arrestors(HEPA) Filters

Used in conjunction with a baghouse or cartridge filter as a prefilter, high-efficiency particulate arrestors (HEPA) filters can trap toxic particles as small as 0.1 µm at an efficiency of 99.99 percent or greater. Like cartridge filters, HEPA filter elements are of pleated construction. Air-to-cloth ratios for HEPA filters are low due to high media density, low porosity, and resulting high-pressure drop. HEPA filters are generally limited to ambient temperature (100^{o}F), though special applications for higher temperatures are available. Unlike bags or cartridge filters, HEPA filters are not automatically cleaned. When a HEPA filter element becomes loaded with particulate matter, the element is changed out and disposed of as dry solid waste (possibly hazardous).

Wet Packed Scrubber

The standard air pollution control system for electroplating and anodizing, these devices consist of a vertical column made of fiberglass or other non-corrosive material loosely filled with specially shaped plastic packing material which maximizes gas-to-liquid contact and minimizes pressure drop across the column. Exhaust air from a plating or anodizing tank line enters at the bottom of the scrubber and exits at the top. The scrubbing solution is pumped from a reservoir at the base of the scrubber and sprayed down into the packing from the top. This flow scheme is called counter-current scrubbing and is the dominant method in use today due to its high pollutant removal efficiency, ranging from 90 to 98 percent, depending on residence (contact) time and solution freshness.

Wet packed scrubbers typically use a caustic solution (dilute sodium hydroxide) for absorbing acid mists. For absorbing caustic mists, acid solutions (dilute sulfuric acid) are typically employed. Scrubber solutions are maintained at the proper pH by automatic addition of concentrated sodium hydroxide or sulfuric acid solutions to scrubber make-up water, whichever is applicable. Usually, just slightly acidic or basic conditions are maintained with pH in the 5 to 6 range for acid solutions or 8 to 9 range for caustic solutions. As the scrubber solution becomes loaded with absorbed air contaminants, including trace metals and salts resulting from neutralization reactions, scrubber efficiency is diminished and the risk of clogging the packing increases. Therefore, scrubber solutions must be refreshed by either continuously draining off a small flow of solution and replacing it with fresh water and reagent (the engineering term for this is "blowdown") or by periodically replacing the entire contents of the scrubber solution reservoir. In either case, a liquid/sludge waste stream containing metals and salts is generated. With continuous blowdown, the liquid effluent may need on-site pretreatment prior to discharge into municipal sewers to remove heavy metals. With periodic change out, the spent solutions may need to be disposed of as liquid hazardous waste.

Control Technology for Toxic Volatile Organic Compounds (T-VOC) and Combined Controls for Toxic Halogenated Organic Compounds (T-HOC)

Table 1-2 summarizes feasible air pollution control technologies for T-VOC and T-HOC. These control techniques are characterized by moderate to high-energy requirements in most applications. Pressure drops can range from very low (afterburners) to very high (carbon adsorption), with corresponding energy requirements. In general, high DRE controls are also high-energy controls with correspondingly high operating costs.

Table 1-2 Controls for T-VOC and Halogenated T-VOC

CONTROL TECHNOLOGY	SUBSTANCE GROUP	CONTROL EFFICIENCY
Combined Controls:		
Regenerative thermal oxidizer with dry scrubber and PTFE membrane baghouse	Halogenated T-VOC (high concentration)	99.9 - 99.99 %
Moving bed carbon adsorption concentrator with regenerative thermal oxidizer, dry scrubber and PTFE membrane baghouse	Halogenated T-VOC (high concentration)	90 - 99 %
Carbon Absorption Controls:		
Fixed bed with regenerative solvent reclaimer	T-VOC Halogenated T-VOC	50-99 %
Moving bed with regenerative solvent reclaimer	T-VOC Halogenated T-VOC	50-99 %
Moving bed with regenerative thermal oxidizer	T-VOC	50-99 %
Fluidized bed with regenerative thermal oxidizer	T-VOC	50-99 %
Fixed bed disposable	T-VOC Halogenated T-VOC	50-99 %

Oxidation

Oxidation is the process of converting VOC gases to carbon dioxide and water through combustion. Of the various types of oxidizers available, the two basic types of equipment used most often are thermal oxidizers and catalytic oxidizers (Table 1-3). Thermal oxidizers rely on direct contact between toxic gases and high-temperature flames to disassociate and destroy toxic substances. Catalytic oxidizers rely on an active catalyst bed at moderate temperatures to break intramolecular bonds, also causing disassociation and destruction of toxic substances.

Table 1-3 Thermal and Catalytic Controls for T-VOC

CONTROL TECHNOLOGY	SUBSTANCE GROUP	CONTROL EFFICIENCY
Direct flame afterburner 1,200 - 1,400 ^{o}F, t> 0.3 sec*	T-VOC EtO	95-98 %
Recuperative heat exchanger oxidizer 1,400 - 1,600 ^{o}F, t > 0.5 sec	T-VOC	98-99 %
Regenerative heat exchanger oxidizer 1,800 - 2,000 ^{o}F, t > 0.8 sec	T-VOC	99-99.9 %
Catalytic oxidizer 700 - 800 ^{o}F, t > 0.1 sec	T-VOC EtO	90-95 %

Thermal Oxidizers

There are three main categories of thermal oxidizers that could be used to control VOCs: afterburners with no heat recovery, thermal oxidizers with recuperative heat recovery and highly efficient regenerative heat recovery oxidizers. When thermal oxidizers are used to destroy halogenated organic compounds, special materials or construction are often required, such as fiber-reinforced plastic (FRP) or stainless steel. In addition, a downstream scrubber is frequently needed to minimize releases of halogenated acid gases. The extent and type of these additional items depend upon the level of the halogenated compounds in the inlet stream and applicable regulatory requirements. The following paragraphs briefly describe the three types of thermal oxidizers.

Afterburners: Afterburners are most commonly used to control intermittent and emergency releases of VOCs. Due to factors such as noise and the lack of heat recovery, (which results in high energy consumption and high NO_X, CO, and CO_2 emissions) their use for steady-state control of VOCs is not widespread. They are most often used for controlling intermittent releases of ethylene oxide from medical or food product sterilizers. Afterburners operate in the 1,200 ^{o}F to 1,400 ^{o}F range with a residence time of at least 0.3 seconds and destruction removal efficiency of 95 to 98 percent.

Both recuperative and/or regenerative thermal oxidation systems generally consist of a refractory-lined chamber, one or more burners, a temperature-control system and heat-recovery equipment. Contaminated gases are collected by an industrial ventilation system and delivered to the preheater inlet, where they are heated by indirect contact with the hot oxidizer exhaust. Gases are then mixed thoroughly with the burner flame in the upstream portion of the unit, and then pass through the combustion zone where the combustion process is completed. The VOC concentrations in most industrial process vent-streams are too low for self-sustaining combustion. Therefore, a supplemental fuel (natural gas) is required. Depending on the heat recovery efficiency, this supplemental fuel requirement may or may not translate into significant annual operating costs.

Recuperative thermal oxidizers: Recuperative thermal oxidizers recover 60 to 80 percent of the system's energy demands with a shell and tube type heat exchanger. Recuperative units operate in the 1,400^{o}F to 1,600^{o}F range with a residence time of at least 0.5 seconds and DREs of 98 to 99 percent. Thermal oxidizers with recuperative heat exchangers can recover 80 to 95 percent of the energy requirement. These recuperative thermal oxidizers use a ceramic medium for heat transfer, which is stored in three or more dedicated beds that feed a central combustion chamber. Valves control which bed is being preheated by exhaust gases and which bed is transferring its heat to incoming VOC contaminated air.

Regenerative thermal oxidizers: Regenerative units operate in the 1,800 ^{o}F to 2,000 ^{o}F range with a residence time of at least 0.8 seconds and DREs of 99 to 99.9 percent. Regenerative oxidizers cost more than recuperative designs of equal capacity. However, their life-cycle costs are less because annual fuel costs are less than for recuperative units.

Catalytic oxidizers

Catalytic oxidation is similar to thermal oxidation in that heat is used to convert the VOC contaminants to carbon dioxide and water. However, a catalyst is used to lower the oxidation activation energy, allowing combustion to occur at 600^{o}F to 800^{o}F, significantly lower temperatures than those of thermal units. In catalytic oxidation, the preheated gas stream is passed through a catalyst bed, where the catalyst initiates and promotes the oxidation of the VOC without being permanently altered itself. Catalyst units have a residence time of at least 0.1 seconds and DREs of 90 to 95 percent. The primary advantage of catalytic oxidation over thermal oxidation is lower fuel cost, depending on the efficiency of the air preheater. Disadvantages include higher capital costs, periodic catalyst replacement, and the inability to handle halogenated organics.

The most common catalyst configuration is the plate-and-frame arrangement, in which blocks of catalyst material are held in place within the oxidizer body by a metal frame. The catalyst consists of a reactive material (such as platinum, platinum alloys, copper chromite, copper oxide, chromium, manganese or nickel) on an inert substrate (such as honeycomb-shaped ceramic). For the catalyst to be effective, the reactive sites upon which the VOC gas molecules react must be accessible. The build-up of polymerized material or reaction with certain metal particulates will prevent contact between reactive sites and the exhaust gas. A catalyst can be reactivated by removing such a coating. Cleaning methods vary with the type of catalyst and include air blowing, steam blowing and operating at elevated temperatures (100^{o}F above the operating temperature) in a clean air stream. As with other catalytic processes, oxidation catalyst material can be lost by erosion, attrition, and vaporization at high temperatures.

<u>Carbon Adsorption</u>

Adsorption is a process by which VOCs are retained on the surface of granular solids. The solid adsorbent particles are highly porous and have very large surface-to-volume ratios. Gas molecules penetrate the pores of the adsorbent and contact the large surface area available for adsorption.

Materials such as activated carbon, silica gel, or alumina may be used as adsorbents. Activated carbon is the most common adsorbent for VOC removal. Carbon may also be used to remove other compounds such as sulfur-bearing or odorous materials. Advantages of carbon adsorption include the recovery of a relatively pure product for recycle and reuse and a high removal efficiency with low inlet concentrations. In addition, if a process stream is already available onsite, additional fuel costs are low, the main energy requirement being electrical power to run fan motors. Disadvantages are the potential generation of a hazardous organic waste if the recovered product cannot be reused, the generation of potentially contaminated wastewater that must be treated (when regeneration is by steam), and potentially higher operating and maintenance costs for the disposal of these two waste streams.

Fixed, moving, or fluidized-bed regenerative carbon adsorption systems operate in two modes, adsorption and desorption. Adsorption is rapid and removes from 50 to 99 percent of VOCs in the air stream, depending on their composition, concentration, temperature, and bed characteristics. Well-designed and operated systems, however, can usually achieve removal efficiencies in the 90 to 99 percent range. Eventually, the adsorbent becomes saturated with the vapors and system efficiency drops. At this point (called "breakthrough," since the contaminants "break through" the saturated bed), the VOC contaminated stream is directed to another bed containing regenerated adsorbent, and the saturated bed is then regenerated. Although it is possible to operate a nonregenerative adsorption system (i.e., the saturated carbon is disposed of and fresh carbon is placed into the bed), most applications, especially those with high VOC loadings, are regenerative.

The adsorption/regeneration cycle can last from a few hours to many days, depending on the inlet VOC concentration, the variability of VOC loading and the design parameters of the carbon bed (e.g., the amount of carbon and the bed's depth). Saturated carbon beds can be regenerated with steam, hot air, or a combination of vacuum and hot gas. Although the bed can be regenerated, complete desorption is not possible, and a small amount of VOC (called a "heel") will remain on the bed after each regeneration. After time, the bed can no longer be used and must be replenished with fresh carbon. Carbon life of five years is typical. The concentrated VOCs in the regeneration stream must be reclaimed (decanted or distilled), destroyed (oxidized), or otherwise disposed of in an environmentally sound manner.

An important consideration in the design of a carbon adsorption system is the temperature of the gas stream. Adsorption capacity of the carbon, and thus the performance of the adsorber, are directly related to this temperature -- adsorption capacity decreases with increasing temperature. Operating temperature must be less than 100^{o}F. Otherwise, the gas will have to be cooled in a heat exchanger prior to being passed through the absorber. Also, the relative humidity of the gas stream can affect the operating capacity of the carbon, and should not exceed 50 percent. Entrained liquid and particulate matter can also cause operating problems, such as plugging, and should be removed by mist eliminators or a packed filter upstream of the absorber. In addition, VOCs with boiling points above 300^{o}F (such as phenol) will be collected by the carbon, but will not be removed during regeneration of the bed. These compounds should be removed upstream of the absorber inlet or captured on a sacrificial bed in the absorber.

Equipment has been developed that combines moving-bed activated carbon adsorption with thermal or catalytic oxidation. VOCs are collected by rotating-wheel carbon beds and subsequently desorbed with hot air. The concentrated exhaust stream is then sent to a thermal or catalytic oxidizer, where the VOC is combusted. The benefit of this configuration is that the volume of the desorption air stream is as much as fifteen times less than the original VOC stream, which translates into a smaller and less expensive oxidizer. Fuel costs are also lower than for a full-sized oxidizer for the same application. This approach is particularly useful for VOC streams with low concentrations and high volumes [concentrations less than 100 ppm and flow rates over 10,000 cubic feet per meter (CFM)], such as paint spray booths. Combination systems provide the inherent advantages of the individual techniques - the high destruction efficiency and no generation of liquid or solid waste of oxidation, and the low fuel consumption and good control efficiency of adsorption - without many of the disadvantages of each system. The ability of combination units to concentrate the VOC emission stream and thus lower the flow rate requiring oxidation not only minimizes the capital costs associated with the oxidizer, but also maximizes the energy input derived by combusting the VOC. In addition, by eliminating the steam for regeneration (and the subsequent condensate), the system does not generate contaminated wastewater.

Chemical Absorption or Wet Scrubbing

Absorption is the mass transfer of selected components from a gas stream into a nonvolatile liquid. Such systems are typically classified by the absorbent used (water or organic liquid, such as mineral oil or low-volatility hydrocarbon solvent). The choice of absorbent depends on the solubility of the gaseous VOC compounds and the cost of the absorbent. Absorption will occur when the concentration of the organic species in the liquid phase is less than the equilibrium concentration of the gaseous component. The gradient between the actual and the equilibrium concentrations is the driving force. Absorption is a function of both the physical properties of the system and the operating parameters of the absorber. The best absorption systems are characterized by low operating temperatures, large contacting surface areas, high liquid-to-gas (L/G) ratios and high VOC concentrations in the gas stream. Removal efficiencies in the 90 to 98 percent range may be achieved for well-designed and operated systems. Absorption is also efficient for dilute streams provided the VOC is highly soluble in the absorbent. Packed columns and plate columns are commonly used for high-efficiency pollution control applications.

The efficiency of absorption as a VOC control technique depends on several factors: the solubility of the VOC in the solvent; the concentration of the VOC in the gas stream; temperature; the L/G ratio; and the contact surface area. Higher gas solubilities and inlet concentrations provide a larger driving force for more efficient absorption. Since lower temperatures correspond to higher gas solubilities, absorption is also enhanced at reduced temperatures. The solvent flow rate is determined from the minimum L/G ratio, which can be found from material balances and equilibrium data. Generally, the most economical absorption factor is 1.25 to 2 times the minimum L/G. Absorption efficiency increases with contact surface area. Increasing the surface area, however, also raises the pressure drop through the packed bed. Thus, while a larger contact surface area may increase the overall removal efficiency, the higher energy consumption (fan power) may make it uneconomical.

Two modes of operation are typical for absorption systems: simple absorption and complex absorption. Simple absorption uses a single liquid pass system, where the VOC contaminated liquid is disposed of directly after exiting the absorber. In complex absorption, the VOC contaminant is recovered via stripping or other desorption techniques and the cleaned absorbent is recycled to the absorber. This option is generally feasible for organic-based systems employing expensive absorbents. In either case, waste streams are generated. In simple absorption systems where the absorbent is water, dilute acids, or dilute caustics, the spent solution, called "blowdown," is continuously bled off and replenished with fresh reagent. Typical blowdown rates are one to 10 percent of the solution recirculation rate, depending on the concentration of VOC air contaminants being absorbed. In complex absorption systems, a concentrated VOC stream is generated and must be reclaimed, destroyed, or otherwise disposed of in an environmentally sound manner.

CHAPTER 2

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Discussion and Evaluation of Environmental Checklist

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Proposed Amended Rules to Implement Office of Environmental Health Hazard Assessment (OEHHA) Revisions to the Air Toxics Hot Spots Program Risk Assessment Guidelines
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive, Diamond Bar, CA 91765
Rule Contact Person:	Eugene Kang, (909) 396-3524
CEQA Contact Person:	Cynthia Carter, (909) 396-2431
Project Sponsor's Name:	South Coast Air Quality Management District
Project Sponsor's Address:	21865 Copley Drive, Diamond Bar, CA 91765
General Plan Designation:	Not applicable
Zoning:	Not applicable
Description of Project:	Not applicable
Surrounding Land Uses and Setting:	Not applicable
Other Public Agencies Whose Approval is Required:	Not applicable

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact issues have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed project. An explanation relative to the determination of the significance of the impacts can be found following the checklist for each area.

☑	Aesthetics	☐	Geology and Soils	☐	Population and Housing
☐	Agricultural Resources	☑	Hazards and Hazardous Materials	☑	Public Services
☑	Air Quality	☑	Hydrology and Water Quality	☐	Recreation
☐	Biological Resources	☐	Land Use and Planning	☑	Solid/Hazardous Waste
☐	Cultural Resources	☐	Mineral Resources	☑	Transportation/Traffic
☑	Energy	☑	Noise	☑	Mandatory Findings

DETERMINATION

On the basis of this initial evaluation:

- ☑ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline §15252, COULD NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts has been 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 in the project have been made by or agreed to by the project proponent. An ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

- ☐ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

- ☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, 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 ASSESSMENT 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 ASSESSMENT pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL ASSESSMENT, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: March 23, 2015 **Signature:** Michael Krause

Michael Krause
Program Supervisor, CEQA Section
Planning, Rules, and Area Sources

DISCUSSION AND EVALUATION OF ENVIRONMENTAL IMPACTS

As previously discussed, implementation of the Revised OEHHA Guidelines is expected to increase the estimated health risk by about 3 times. This Draft EA evaluated potential adverse environmental impacts that could potentially occur from additional air pollution control equipment needed as a result of implementing the Revised OEHHA Guidelines for permitting new and modified sources (Rules 1401 and 1401.1) and facilities under the AB2588 Hot Spots program (Rule 1402). There are no expected environmental impacts resulting from amendments to Rule 212 as a result of the revised OEHHA guidelines because changes to this rule are administrative in nature and do not require or cause a physical change to the environment. This analysis assumes that there would be 112 new or modified permit applications and about six AB2588 facilities that could potentially be affected annually and require additional pollution control equipment. Potential adverse environmental impacts can occur from the construction and operation of air pollution control equipment. A discussion of the assumptions and basis for the number of facilities that could potentially require additional pollution control devices (APCDs) for each rule is discussed below.

Rule 212 Analysis

Rule 212 establishes standards for approving permits and issuing public notice. Under Rule 212, public notification is required for installation of new or modified equipment that increases risk by one in one million. This provision does not apply to facilities that have a facility-wide risk of less than ten in one million. The requirements in Rule 212 are administrative and informational in nature, and will not have any direct or indirect physical environmental impact.

Rule 1401 and 1401.1 Analysis

To identify new and modified permitted equipment source categories that under Rule 1401 and 1401.1 could potentially need new or additional air pollution controls as a result of using the Revised OEHHA Guidelines, the SCAQMD staff evaluated permits that were issued over a five year period from October 2009 to October 2014. Based on this evaluation, the SCAQMD staff identified three general groups of equipment source categories based on the need for new or additional pollution controls using the Revised OEHHA Guidelines:

1) No new or additional air pollution controls needed:
2) New or additional pollution controls likely needed and/or additional time needed to evaluate potential impacts; and
3) Potential for new or additional air pollution controls could be required for some permits within an equipment source category.

Under the first group, no new or additional pollution controls are expected using the Revised OEHHA Guidelines because either the cancer risk was well below the Rule 1401 risk thresholds of 1 in one million without T-BACT, and 10 in one million with T-BACT, or there were no toxic emissions associated with the permitted source. For the first group, no further environmental analysis was needed. Under the second group, SCAQMD staff identified two equipment source categories (1) coating and solvents used in spray booths, and (2) retail gasoline dispensing facilities. For coating and solvents used in spray booths, for a percentage of permits reviewed it is likely that new or additional pollution controls would be needed to meet the Rule 1401 cancer risk threshold using the Revised OEHHA Guidelines. For retail gas stations, the SCAQMD staff has received new information from CARB staff regarding the latest speciation of emissions from gasoline dispensing. The SCAQMD staff needs additional time to assess the effects of this information and how it could affect new and modified gasoline dispensing facilities combined with the Revised OEHHA Guidelines. Therefore, Rule 1401 includes a provision to allow these two source categories to continue to use the existing OEHHA Guidelines. The SCAQMD staff will develop source-specific requirements for these source categories to reduce toxic emissions and to address potential permitting issues. For gasoline dispensing facilities, the SCAQMD staff will expedite review of emissions data for gasoline dispensing to better understand potential impacts from gasoline dispensing facilities before using the Revised OEHHA Guidelines. Since these two equipment and industry categories will continue to use the previous SCAQMD permitting guidelines (Version 7.0, July 2005), there are no additional adverse environmental impacts associated with the Revised OEHHA Guidelines of implementation of PAR 1401 and 1401.1.

Lastly under the third group, based on review of five years of permitted data there were five equipment source categories that the estimated cancer risk with the Revised OEHHA Guidelines could require additional controls: metal plating facilities, crematories, plasma arc and laser cutting, wet gate printing and film cleaning, and asphalt and concrete batch blending. Table 2-1 provides a summary of the affected toxic air contaminants and the possible air pollution control technology for these each of the identified source categories. For plasma arc and laser cutting, most permits are currently close to 1 in one million so it is reasonable to expect for this source category nearly all permits for plasma arc and laser cutting will need additional air pollution controls in order to satisfy T-BACT requirements in Rule 1401, for sources exceeding 1 in a million cancer risk. The SCAQMD staff is working on a rule for metal grinding and cutting that will address emissions from plasma arc and laser cutting. Based on the permitted data, staff estimates that approximately 24 plasma arc and laser cutting permits annually could have estimated health risks greater than 1 in a million requiring pollution additional controls such as a bag house to capture metal particulates. For the remaining equipment or industry categories in Table 2-1, based on the five years of permitted data approximately one permit per year could potentially require additional air pollution controls.

Table 2-1 PAR 1401 New or Modified Permits that Potentially Could Require Additional Pollution Controls Using the Revised OEHHA Guidelines

Equipment Category	Toxic Air Contaminants	Typical Control Device
Metal Plating Facilities – Plating Tanks	Metal – nickel, hexavalent chromium, cadmium	HEPA filter for nickel plating tank
Crematory – Furnace	Combustion emissions – PAHs	Oxidation catalysts
Plasma Arc and Laser Cutting	Nickel and hexavalent chromium emissions	Baghouse for metal particulates
Wet Gate Printing and Film Cleaning (Perc)	Perchloroethylene emissions from film cleaning	Carbon adsorber
Asphalt Blending and Concrete Batch (Diesel ICEs)	Diesel particulate	Diesel particulate filter on diesel engine

[1] Based on SCAQMD analysis of permits issued between 2009 and 2014.

SCAQMD staff did not include equipment or industry categories that are exempt from Rule 1401 such as emergency internal combustion engines and wood product stripping. SCAQMD staff also did not analyze impacts for permits related to change of ownerships, alterations, or modifications that did not result in an increase in toxic emissions. District Rule 1421 – Control of Perchloroethylene Emissions from Dry Cleaning Systems contain requirements for the phase out of perchloroethylene dry cleaning equipment by 2020 and the state ATCM does not allow purchase of new perchloroethylene dry cleaning equipment. SCAQMD staff did not include the permitting of this equipment category into the impact analysis for this rule development since permitting data shows no permits issued for new perchloroethylene dry cleaning machines over the past five years.

AB2588 Air Toxics Hot Spots Program (Core Facilities) – Rule 1402 Analysis

Since Rule 1402 adoption in 1994, the SCAQMD staff has approved approximately 300 facility HRAs. Based on the most recent approved HRAs for each facility, the SCAQMD staff estimates that about 22 facilities could potentially have a cancer risk greater than or equal to 25 in a million when using the Revised OEHHA Guidelines. Under Rule 1402, if the facility-wide health risk is greater than or equal to the action risk level the operator is required to implement risk reduction measures specified in a risk reduction plan to reduce the impact of total facility emissions below the action risk level as quickly as feasible, but by no later than three years. Regarding facilities that are in the AB2588 program, but have not been required to submit an HRA, the SCAQMD staff found that although more facilities will likely be required to submit an HRA, it is not expected that their cancer risk will be over the action risk threshold of 25 in one million. Therefore, no additional pollution controls are assumed for those facilities.

SCAQMD staff evaluated the main toxic driver(s) for a total of 22 AB2588 affected facilities that could potentially be required to implement risk reduction measures to make an estimate of the types of additional pollution controls that could potentially be implemented. Rule 1402 establishes a "facility-wide" risk threshold, so there are a variety of options which can be implemented such as process changes, material changes, additional air pollution controls, and reduced throughput. Table 2-2 summarizes the types of the 22 facilities, key toxic air contaminants that are contributing to the cancer risk, and the type of air pollution controls that could be implemented to reduce the cancer risk.

Table 2-2 PAR 1402 Potential Air Pollution Control Device(s) For Use to Reduce Cancer Risk by AB2588 Facilities

Facility Type	Key Toxic Driver	Air Pollution Control Device(s)
Aerospace	hexavalent chromium, perchloroethylene, tetrachloroethylene	Scrubber, Carbon Adsorber
Aerospace	hexavalent chromium, cadmium	HEPA, Scrubber
Aerospace	perchloroethylene, tetracholorethylene, hexavalent chromium	Carbon Adsorber, HEPA, Scrubber
Aerospace	hexavalent chromium	HEPA, Scrubber
Aerospace	hexavalent chromium	HEPA, Scrubber
Aerospace	lead	HEPA, Scrubber
Asphalt Manufacturer	PAHs, formaldehyde	Scrubber, Carbon Adsorber

Facility Type	Key Toxic Driver	Air Pollution Control Device(s)
Hospital	formaldehyde, PAHs	Thermal oxidizer, Oxidation catalysts
Metal Forging and Heat Treating	nickel	HEPA, Scrubber
Metal Melting	cadmium, lead	HEPA, Scrubber
Metal Melting	cadmium, lead	HEPA, Scrubber
Metal Melting	arsenic, cadmium	Scrubber
Metal Plating and Finishing	hexavalent chromium, nickel, cadmium	HEPA, Scrubber
Metal Plating and Finishing	hexavalent chromium	HEPA, Scrubber
Metal Plating and Finishing	hexavalent chromium	HEPA, Scrubber
Petroleum Refining	1,3-butadiene, hexavalent chromium	Thermal oxidizer, HEPA
Petroleum Refining	diesel particulate matter, 1,3-butadiene (engines)	Diesel particulate filters, Thermal Oxidizer
Petroleum Refining	benzene, PAHs	Thermal oxidizer, Oxidation catalyst
Petroleum Refining	diesel particulate matter (engines), arsenic	Diesel particulate filters, Scrubber
Waste Management	dioxins, furans	Thermal oxidizer
Waste Management	formaldehyde	Carbon Adsorber
Waste Management	formaldehyde	Carbon Adsorber

It is assumed that 22 facilities could potentially need to install additional air pollution controls due to the Revised OEHHA Guidelines. This is based on review of approved HRAs that have been received through implementation of the AB2588 program. This is likely a conservative estimate (meaning there are not likely to be more such facilities) where staff estimated based on previously approved HRAs. It is possible that some facilities could have implemented emission reduction projects that have reduced air toxic emissions and health risks since the HRA was approved.

AB2588 is the state-required Air Toxics Hot Spots Program required by Health and Safety Code §44360(b)(2) which is implemented here in the SCAQMD through Rule 1402. Under the AB2588 program, facilities are divided into four implementation groups. During the "quadrennial" review, AB2588 facilities are required to submit a more detailed emissions inventory for 177 toxic air contaminants. (During the three years between the quadrennial review AB2588 facilities submit a toxics inventory for 23 toxic air contaminants.) Based on the quadrennial toxics emissions inventory, SCAQMD staff prioritizes facilities and sends a letter to those facilities with a high Priority Score to submit an even more detailed emissions inventory and HRA. Implementing the AB2588 program using the quadrennial review approach provides a more even workflow and reduces the impact on affected facilities to provide a detailed inventory. Implementation of the Revised OEHHA Guidelines will follow the existing quadrennial review process. Thus staff analysis examined actions and operations over a four year period to estimate future impacts. It is speculative to assume beyond these proposed requirements that will be well established by then and the nature of business operations, need and usage of TACs, and cleaner technologies are expected to change the impacts beyond four years.

The review and approval process for the AB2588 program is staggered, even for facilities within the same quadrennial review cycle. SCAQMD staff is estimating that of the 22 identified

AB2588 facilities, one-fourth of the 22 facilities which is approximately six AB2588 facilities could potentially install air pollution control equipment annually. In analyzing the potential impacts of the Revised OEHHA Guidelines, for worst case analysis it is assumed that 2 facilities would be installing equipment on a given day.

A total of 134 facilities are estimated to be installing and operating 152 pieces of control equipment. A summary of the types of pollution controls from Rules 1401 and 1402 are provided in Table 2-3 below.

Table 2-3 Summary of Types of APCD's to be Installed at Estimated Affected Facilities and Analyzed for Impacts

	Types of APCDs							
	HEPA Filters	**Oxidation Catalysts**	**Baghouses**	**Carbon Adsorber**	**Diesel Particulate Filter**	**Wet Scrubbers**	**Thermal Oxidizers**	**Total**
PAR 1401 Impacts (# of APCDs)	4	4	96	4	4	0	0	112
PAR 1402 Impacts (# of APCDs)	12	3	0	4	2	14	5	40
Total	16	7	96	8	6	14	5	**152**
Environmental Topics to be Analyzed	• Aesthetics • AQ • Solidwaste	• Aesthetics • AQ • Solidwaste	• Aesthetics • AQ • Energy	• AQ • Energy	• AQ • Energy	• Aesthetics • AQ • Energy • Hydrology • Solidwaste	• Aesthetics • AQ • Energy	

ENVIRONMENTAL CHECKLIST AND DISCUSSION

I. AESTHETICS.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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 within a state 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 which would adversely affect day or nighttime views in the area?	☐	☐	☐	☑

SIGNIFICANCE CRITERIA

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

DISCUSSION

I. a), b), d) In general, the proposed amended rules have no potential to affect scenic vistas because installation of add-on control equipment (i.e. HEPA filters, Thermal Oxidizers, Oxidation Catalysts, DPFs, Wet Scrubbers, Baghouses, and Carbon Adsobers) will occur at commercial, industrial, or institutional facilities. Likewise, additional light or glare would not be created since no additional light generating equipment would be required for the amended rule's implementation. Equipment used to control TAC emissions is typically located inside buildings which are located in industrial/commercial areas.

I. c) There will be additional pieces of industrial control equipment (i.e. HEPA filters, Thermal Oxidizers, Oxidation Catalysts, DPFs, Wet Scrubbers, Baghouses, and Carbon Adsobers), but the facilities will be installing in an existing commercial, industrial setting with commercial, industrial and institutional equipment so not likely to change the usual character or quality of the site and its surrondings. Therefore, there will be no significant impact to substantially degrade the existing visual character.

II. AGRICULTURE AND FOREST RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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 a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104 (g))?	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑

Significance Criteria

Project-related impacts on agriculture and forest resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).

- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

DISCUSSION

II. a), b), c), & d) No Impact. Land use, including agriculture- and forest-related uses, and other planning considerations are determined by local governments. While implementation of the proposed project may cause air pollution control equipment to be installed and operated on existing equipment to control toxic emissions, these activities will occur at established toxic emitting facilities which are located on previously developed land in primarily industrial areas and are not located in the vicinity of agricultural or forest areas.

Further, no new construction of buildings or other structures is expected that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses or a Williamson Act contract. Further, because the proposed project does not require construction or operation activities within an area designated as forest land, implementation of the proposed project is not expected to conflict with any forest land zoning codes or convert forest land to non-forest uses. Similarly, there is nothing in the proposed project that would affect or conflict with existing land use plans, policies, or regulations or require conversion of farmland to non-agricultural uses or forest land to non-forest uses. Thus, no agricultural land use or planning requirements will be altered by the proposed project.

Finally, in the event the proposed project is implemented, the installation of toxic control equipment will ensure that projected toxic emission reductions will occur and that air quality in the region will improve. Thus, assuring that these air quality improvements occur could provide benefits to agricultural and forest land resources by reducing the adverse oxidation impacts of ozone on plants and animals located in the Basin. Accordingly, these impact issues will not be further analyzed in the Draft EA.

Based upon these considerations, significant agricultural and forest resources impacts are not expected from implementing the proposed project, and thus, this topic will not be further analyzed in the Draft EA. Since no significant agriculture and forest resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

III. AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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 non-attainment under 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)?	☐	☐	☑	☐
g) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
h) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☑

Significance Criteria

To determine whether or not air quality impacts from the proposed project may be significant, impacts will be evaluated and compared to the criteria in Table 2-4.

Table 2-4 SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction** [b]	***Operation*** [c]
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

Toxic Air Contaminants (TACs), Odor, and GHG Thresholds	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
GHG	10,000 MT/yr CO2eq for industrial facilities

Ambient Air Quality Standards for Criteria Pollutants [d]	
NO2 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)
PM10 24-hour average annual average	 10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$
PM2.5 24-hour average	 10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation)
SO2 1-hour average 24-hour average	 0.25 ppm (state) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)
Sulfate 24-hour average	 25 $\mu g/m^3$ (state)
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)
Lead 30-day Average Rolling 3-month average	 1.5 $\mu g/m^3$ (state) 0.15 $\mu g/m^3$ (federal)

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[d] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day   ppm = parts per million $\mu g/m^3$ = microgram per cubic meter   ≥ = greater than or equal to
MT/yr CO2eq = metric tons per year of CO2 equivalents   > = greater than

DISCUSSION
As discussed earlier under the "Environmental Checklist and Discussion", there are no expected impacts from Rule 212 as a result of the revised OEHHA guidelines. A discussion of the assumptions and basis for the number of facilities that could potentially require additional pollution controls under Rules 1401, 1401.1 or 1402 is discussed below. A summary of the type of pollution controls to be installed is provided in Table 2-3.

III. a) The SCAQMD is required by law to prepare a comprehensive district-wide Air Quality Management Plan (AQMP) which includes strategies (e.g., control measures) to reduce emission levels to achieve and maintain state and federal ambient air quality standards, and to ensure that new sources of emissions are planned and operated to be consistent with the SCAQMD's air quality goals. The AQMP's air pollution reduction strategies include control measures which target stationary, area, mobile and indirect sources. These control measures are based on feasible methods of attaining ambient air quality standards. Pursuant to the provisions of both the state and federal Clean Air Acts (CAA)s, the SCAQMD is required to attain the state and federal ambient air quality standards for all criteria pollutants.

Toxic Air Contaminants: General Identification and Control Measures (AB 2728)
AB 2728 was enacted in 1992 and amends the Tanner process (AB 1807) to reflect the shift of certain duties from the DHS to the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessments (OEHHA). This law requires the ARB to identify all 188 hazardous air pollutants (HAPs) listed under Title III of the 1990 CAA Amendments as TACs under the AB 1807 process. It encourages local air districts to adopt TAC programs to enable local enforcement of Title III - Air Toxics of the federal CAA. AB 2728 further provides that districts may adopt more stringent requirements than those provided under AB 1807. Health & Safety Code 44300 et. Seq. sets forth the state's Air Toxics "Hot Spots" Program, which requires districts to use OEHHA for risk assessment. H&S 44360(b)(2)

Therefore, implementing the proposed rule amendments do not conflict or obstruct implementation of the AQMP or federal CAA.

III. b) and f) ***Criteria Pollutants***

Construction Impacts

<u>Affected Facilities</u>
SCAQMD staff is not certain as to the number of new and modified facilities planned to be constructed in the future. In order to reasonably foresee the number of future facilities affected by the proposed amendments, as previously discussed at the beginning of this Chapter, SCAQMD staff evaluated permitted data over a five year period from October 2009 to October 2014 to determine how those new and modified permits could potentially be affected by the Revised OEHHA Guidelines. The number of affected facilities and corresponding impacts to those facilities or operational activity of new or existing facilities were used as a surrogate to reasonably foresee and analyze possible impacts. SCAQMD staff is estimating permitting impacts over a four year period. Construction of new facilities beyond the four years scope is considered speculative according to CEQA Guidelines §15145 and will not be evaluated further in this analysis.

Construction emissions were estimated for the various construction phases for the installation of APC equipment. The phases are: grading/site preparation, paving, and equipment installation[2]. In addition, criteria pollutant emissions were calculated for all on-road vehicles transporting workers, vendors, and material removal and delivery. Since all phases must be entirely completed before the next phase can commence, there would be no overlap of construction phases for the construction of the new APCDs.

Any process substitutions or product reformulations are not expected to require installation of new equipment. Activities during construction that could potentially adversely affect air quality are those activities associated with the installation of control equipment.

PROJECT-SPECIFIC IMPACTS: The primary source of construction air quality impacts would be from those facilities installing add-on controls (thermal oxidizers, scrubbers, etc.). The type of construction-related activities attributable to facilities that would be installing control equipment would consist predominantly of cutting, welding, etc. These construction activities would not involve large-scale grading, slab pouring, or paving activities, that would be undertaken at typical land use projects such as housing developments, shopping centers, new industrial facilities, etc. Consequently NOx, SOx, and PM10 emissions from these types of construction activities would not occur as a result of implementing the proposed project. For the purposes of this analysis, construction activities undertaken at affected facilities are anticipated to entail the use of portable equipment (e.g., generators and compressors) and hand held equipment by small construction crews to weld, cut, and grind metal structures.

Construction emission estimates included construction equipment used during the phase (e.g., paver during paving) and on-road vehicles transporting workers, vendors, and material removal and delivery (see Appendix B). Hence, all of the proposed project elements were considered in the daily construction emissions. Because the construction phases do not overlap, the daily emissions are not additive.

To analyze the "worst-case" emissions from construction activities associated with the implementation of proposed amendments, the SCAQMD staff assumed that 2 facilities would be installing APCDs at any given time at affected facilities complying with the new risk thresholds.

The SCAQMD staff assumed that the maximum daily emissions from construction-related activities for each phase would all occur on the same day. Table 2-5 presents the results of the SCAQMD's construction air quality analysis. Appendix B contains the spreadsheets with the results and assumptions used for this analysis.

It should be noted that the analysis of construction air quality impacts was a "worst-case" analysis because it assumes that the peak construction would occur from the facilities that had the most APCDs to install. There are a number of factors that would preclude concurrent construction activities including: availability of construction crews, type and size of control equipment to be constructed, engineering time necessary to plan and design the

[2] *In general, no or limited construction emissions from grading are anticipated because modifications or installation of new equipment would occur at existing industrial/commercial facilities and, therefore, would not be expected to require digging, earthmoving, grading, etc.*

control equipment, permitting constraints, etc. Furthermore, as a "worst-case," the SCAQMD's air quality impacts analysis assumes that construction could take up to two months to complete. Depending on the type and size of the control equipment to be constructed, actual construction time could be substantially less than two months. Further, some affected facilities could reduce emissions through methods other than installing control equipment, thus, eliminating construction impacts at those facilities. Construction emissions at any one facility would not exceed any of the significance thresholds identified in Table 2-5. Finally, once construction is complete, construction air quality impacts would cease.

The peak daily emissions vary for each pollutant depending on the construction phase, which do not overlap in time as a site would need to be graded before pacing and paved before installing. The significance determination for the construction is based on the peak daily emissions during any construction phase. Therefore, all of the construction impacts from the project are not significant for criteria pollutant emissions.

Table 2-5 PARs Daily Peak Construction Emissions in SCAQMD for Two Facilities

Construction Phase	**CO, lb/day**	**NOx, lb/day**	**PM10, lb/day**	**PM2.5, lb/day**	**VOC, lb/day**	**SOx, lb/day**
Grading/Site Preparation	22.9	50.4	**8.0**	**3.2**	5.4	0.1
Paving	15.0	24.0	1.5	1.3	0.5	0.0
Equipment Installation	**29.9**	**59.2**	2.9	2.6	**6.9**	**0.1**
Significance Threshold, lb/day	550	100	150	55	75	150
Exceed Significance?	No	No	No	No	No	No

Localized Significance Thresholds for Construction

The localized significance threshold (LST) methodology was developed to be used as a tool to assist lead agencies to analyze localized impacts associated with proposed projects.

Because the proposed project affects facilities located across the region and it is unknown where future construction would be located, a LST analysis is not possible. The reason is the analysis to determine if construction or operation of the facility would have adverse localized impacts requires knowledge of the location (i.e. source receptor).

Operation Impacts

PROJECT-SPECIFIC IMPACT: Seven different types of add-on control equipment were identified to reduce toxic risk at the affected facilities. Two of the control devices, thermal oxidizers and carbon adsorbers, have the potential to generate adverse secondary air quality impacts during operation. To analyze maximum air quality impacts, it was assumed that for each operation needing to incinerate, the add-on control equipment would be a thermal oxidizer because they generate the highest emissions compared to other types of oxidizers. Thermal oxidizers destroy VOC emissions, but the process produces secondary criteria pollutant emissions such as CO, NO_x, VOC, SO_X, and PM10. Carbon adsorbers possess a carbon bed that requires regeneration for reuse. Emissions are produced when the spent carbon is regenerated.

The operation of the control equipment will reduce toxic exposure and will assist in meeting the risk threshold. The direct and indirect criteria emissions for each control equipment are totaled, in Table 2-8 and are less than the SCAQMD's mass daily operational significance thresholds; therefore, the proposed amendments are not expected to result in significant adverse operational criteria pollutant emission impacts.

Air Quality Assumptions

1. Affected facilities were assumed to operate the control equipment for eight hours per day, six days per week, and 52 weeks per year. These parameters represent a "worst-case" scenario, especially for the thermal oxidizer users because it overestimates the typical hours of high-fired load operation. For example, during some hours of operation incinerators operate on low-fired load when VOC emissions are not being vented to the combustion chamber, which results in lower combustion emissions from the thermal oxidizer. Additionally, not taken into consideration is the fact that hybrid technology has emerged that allows more efficient use of thermal oxidizers.

2. The exhaust emission flowrate (in cubic feet per minute, cfm) was estimated to be at 10,000 cfm.

Thermal Oxidizers

To estimate criteria pollutant emissions from thermal oxidizers, the SCAQMD used general default emission factors. Currently, SCAQMD permitting staff requires thermal oxidizers less than two million British thermal units (MMbtu) per hour to comply with a NOx concentration of 30 parts per million as BACT. This translates to an emission factor of 36 pounds per million cubic feet (MMcf) of natural gas used as the combustion fuel. The actual emission factors were derived from the Annual Emissions Reporting (AER) default emission factor of 130 pounds per MMcf (SCAQMD 2015 AER Program). For CO, VOC, PM10, and SOx, the SCAQMD permitting staff uses the general AER default emission factors for all sizes of thermal oxidizers.

As shown in Table 2-3, five thermal oxidizers were identified as likely to be needed for reducing risks to comply with the Revised OEHHA Guidelines. To calculate the daily emissions, the number of devices is multiplied by the assumed operating schedule and the amount of natural gas consumed, and then divided by the heating value of natural gas. The result is multiplied by the criteria pollutant emission factor to determine the pounds per day of emissions. At 10,000 cfm, the amount of natural gas consumed by a thermal oxidizer is 0.488 MMBTU per hour. The heating value of natural gas is 1050 MMBTU/MMcf.

(5 Thermal Oxidizers x 8 hrs/day x 0.488 MMBTU/hr)/(1050 MMBTU/MMcf) = 0.019 MMcf/day

Table 2-6 shows total criteria pollutant emissions generated by the facilities anticipated to install thermal oxidizers to reduce TAC emissions. Table 2-6 shows criteria pollutant emissions from the thermal oxidizers.

Table 2-6 Estimated Operational Emissions from Thermal Oxidizers

Criteria Pollutant	Emission Factor (lb/MMcf)	MMcf/day	Total Emissions (lb/day)
NO_x	130	0.019	2.47
VOC	7	0.019	0.13
CO	35	0.019	0.67
PM10	7.5	0.019	0.14
SOx	0.83	0.019	0.02

Carbon Adsorbers

As set forth in Table 2-3, approximately seven carbon adsorbers were identified as needed to comply with the proposed amendments instead of thermal oxidizers. For these facilities, thermal oxidizers were not considered to be applicable as a method of controlling TAC emissions. As described in Chapter 1, the initial control efficiency of carbon adsorption equipment is extremely high. As the activated carbon becomes saturated with organic material over time, control efficiency drops until breakthrough occurs. When breakthrough occurs, the saturated carbon must be removed and either disposed of or regenerated and the solvent recovered, or removed and destroyed.

Typically, the carbon is regenerated by raising the temperature of the carbon, evacuating the bed, or both. A regenerant, either steam or a noncondensible gas, is heated and injected into the carbon bed to desorb the organic materials. This procedure is usually performed daily, but may be done more or less frequently, depending on the capacity of the control unit and the concentration of the VOC being collected. The resulting heated organic mixture is vented to a condenser where the organic material is separated from the regenerant by gravity or distillation, and recycled or disposed of properly.

Regenerating carbon typically requires a combustion source using natural gas as the combustion fuel for boilers or steam generators used to heat the regenerant and/or to heat the carbon beds. Only 15 percent of the carbon bed volume collects toxic VOC emissions and a typical carbon bed is sized to reduce 55 pounds of VOC per day. Based on these two characteristics, a typical carbon bed size is approximately 400 pounds (55/0.15 = 400). According to the Standard Handbook of Environmental Engineering (Corbitt, 1990), the projected natural gas fuel use is 5.5 scf per pound of carbon and the carbon bed is assumed to be regenerated four times per day. The amount of natural gas required per day is 0.062 MMcf.

(400 lbs C) x (5.5 scf/lb C per regen) x (4 regen/day) x (8 Carbon Adsorbers) = 0.062 MMcf/day

Using emission factors from the SCAQMD's AER Program, the projected criteria pollutant emissions from the combustion equipment used to regenerate spent carbon are listed in Table 2-7.

Table 2-7 Estimated Operational Emissions from Regenerating Spent Carbon

Criteria Pollutant	AER Emission Factor (lb/MMcf)	Amount of Natural Gas Consumed (MMcf/day)	Total Emissions (lb/day)
NO_x	130	0.062	8.1
VOC	7.0	0.062	0.43
CO	35	0.062	2.2

Operation-related Mobile Source Emissions

PROJECT-SPECIFIC IMPACT: Some types of control equipment generate waste products that will need to be disposed of properly. The wastes and controls include: spent carbon generated from the carbon adsorption process; solids and sludge from wet scrubbers; and dry solids from filtration controls. Although thermal oxidizers produce little or no waste products, this part of the air quality analysis assumed that catalytic oxidizers could be used instead of thermal oxidizers. The catalysts in catalytic oxidizers need to be replaced every few years so this potential waste product was considered to contribute to the waste transport impacts.

Any wastes generated will require delivery and transport to disposal or recycling facilities. It is assumed here that enough waste could be generated as a result of proposed project to require a “worst-case” scenario of 2 truck trips per day of the 134 affected facilities[3] installing a control device to comply with PARs. To calculate transport truck trip emissions, it is assumed that two start-ups would be required, medium-duty trucks (5,000-8,500 pounds) transport wastes, and trucks would travel 20 miles each way.

TOTAL OPERATIONAL EMISSIONS

Total operational emissions from both stationary sources (control equipment) and mobile sources (waste disposal trucks) are shown in Table 2-8. As indicated in Table 2-8, operational emissions anticipated from implementing PARs do not exceed any significance threshold and therefore, are considered insignificant.

Table 2-8 SCAQMD Operational Criteria Pollutant Emissions

Description	CO	NOx	PM10	PM2.5	VOC	SOx
	(lb/day)					
Emissions from Thermal Oxidizers	0.67	2.47	0.14	0.07	0.5	0.05
Emissions from Regenerating Spent Carbon	2.1	8.1	--	--	0.43	--
Emissions from Mobile Sources[4]	0.3	1.4	0	0	0.1	0
Total Operational Emissions	**3.07**	**11.97**	**0.14**	**0.07**	**1.03**	**0.05**
Significance Threshold	550	55	150	55	75	150
Exceed Significance?	No	No	No	No	No	No

[3] *See Section XVII for a further discussion.*

[4] *No new permanent employees are expected for operation of the control equipment as a result of the proposed project; therefore no worker vehicles’ emissions are calculated. However, delivery and disposal of new carbon or removal of spent catalysts is expected to generate mobile source emissions.*

Indirect Criteria Pollutant Emissions from Electricity Consumption

Indirect criteria pollutant and GHG emissions are expected from the generation of electricity to operate new equipment that occurs off-site at electricity generating facilities (EGFs). Emissions from electricity generating facilities are already evaluated in the CEQA documents for those projects when they are built or modified. The analysis in Section VI. Energy b), c) and d)) demonstrates that there is sufficient capacity from power providers for the increased electricity consumption from the PARs.

Under the SCAQMD Regional Clean Air Incentives Market (RECLAIM) program (that regulates NOx and SOx emissions), EGFs were provided annual allocations of NOx and SOx emissions that typically decline annually. However, the proposed project does require an increase energy and that increase in emissions from generating the additional energy (See Section VI Energy for impacts) from the EGFs would be required to offset any potential NOx and SOx emission increases under the RECLAIM program and other pollutants under the New Source Review Project. Thus, impacts from energy generation are anticipated to be to less than significant impacts.

III. c) ***Cumulatively Considerable Impacts***

Based on the foregoing analysis, criteria pollutant project-specific air quality impacts from implementing PARs would not exceed air quality significance thresholds (Table 2-4), cumulative impacts are not expected to be significant for air quality. SCAQMD cumulative significance thresholds are the same as project-specific significance thresholds. Therefore, potential adverse impacts from implementing PARs would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for air quality impacts. Per CEQA Guidelines §15064(h)(4), the mere existing of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable.

The SCAQMD guidance on addressing cumulative impacts for air quality is as follows: "As Lead Agency, the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR." "Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."[5]

This approach was upheld by the Court in *Citizens for Responsible Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal. App. 4th 327, 334. The Court determined that where it can be found that a project did not exceed the South Coast Air Quality Management District's established air quality significance thresholds, the City of Chula Vista properly concluded that the project would not cause a significant environmental effect, nor result in a cumulatively considerable increase in these pollutants. The court found this determination to be consistent with CEQA Guidelines §15064.7, stating, "The lead agency may rely on a threshold of significance standard to determine whether a project will cause a significant environmental

[5] SCAQMD Cumulative Impacts Working Group White Paper on Potential Control Strategies to Address Cumulative Impacts From Air Pollution, August 2003, Appendix D, Cumulative Impact Analysis Requirements Pursuant to CEQA, at D-3, http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper-appendix.pdf?sfvrsn=4.

effect." The court found that, "Although the project will contribute additional air pollutants to an existing nonattainment area, these increases are below the significance criteria…" "Thus, we conclude that no fair argument exists that the Project will cause a significant unavoidable cumulative contribution to an air quality impact." As in *Chula Vista*, here the District has demonstrated, when using accurate and appropriate data and assumptions, that the project will not exceed the established South Coast Air Quality Management District significance thresholds. See also, *Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 Cal. App. 4th 899. Here again the court upheld the South Coast Air Quality Management District's approach to utilizing the established air quality significance thresholds to determine whether the impacts of a project would be cumulatively considerable. Thus, it may be concluded that the Project will not cause a significant unavoidable cumulative contribution to an air quality impact.

III. d) ***Toxic Air Contaminants (TAC)***
Construction
Construction TAC emissions may be generated from diesel exhaust emissions (i.e. heavy-duty trucks and construction equipment).

Diesel exhaust particulate is considered a carcinogenic and chronic TAC. Since construction is expected to last less than three months and carcinogenic health risk is estimated over a 25 year exposure period for off-site occupational receptors and a 30 year exposure period for sensitive receptors, diesel exhaust particulate from construction is not expected to generate significant adverse health risk impacts.

Therefore, the PARs are not expected to generate significant adverse TAC impacts from construction.

Operation
Direct Health Risk Reductions from the PARs
The PARs would be expected to reduce overall TAC emissions. Therefore, the PARs are expected to have the benefit of reducing adverse health risk impacts from the facilities to nearby sensitive receptors.

Secondary Health Risk Impacts from the PARs
The operation of non-combustion APCDs, that may be needed to comply with the PARs, are not expected to generate any TAC emissions. These APCDs are expected to be powered by electricity, so no new combustion emissions would be generated.

The Thermal Oxidizers would generate TAC emissions (i.e. benzene, formaldehyde, and polycyclic aromatic hydrocarbons**)** from the combustion of natural gas. These Thermal Oxidizers will be subject to SCAQMD Air Permits and toxic rules. The Thermal Oxidizers will be evaluated on a case by case basis for their appropriate toxic risk screening levels (i.e. sensitive receptor distances). These toxic risk levels are the same as the CEQA thresholds and these Thermal Oxidizers are expected to comply with the PARs.

Based on the above discussion, the PARs are not expected be significant for exposing sensitive receptors to substantial concentrations.

III. e) *Odor Impacts*
The operation of new APC equipment is not expected to generate any new odors as APC equipment are not typically odor generating equipment. The new APC equipment would be designed to reduce TAC emissions from facilities, which may potentially further reduce odors.

Therefore, the PARs are not expected to generate significant adverse odor impacts.

III. g) and h) *Greenhouse Gas Impacts*
Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of greenhouse gas (GHG) emissions in the atmosphere. The six major types of GHG emissions are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). The GHG emissions absorb longwave radiant energy emitted by the earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect."

The current scientific consensus is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHG emissions in the atmosphere due to human activities. Events and activities, such as the industrial revolution and the increased consumption of fossil fuels (e.g., combustion of gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG emissions. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions (CEC, 2004). Further, approximately 80 percent of GHG emissions in California are from fossil fuel combustion (e.g., gasoline, diesel, coal, etc.).

GHGs are typically reported as CO_2 equivalent emissions (CO_2e). CO_2e is the amount of CO_2 that would have the same global warming potential (relative measure of how much heat a greenhouse gas traps in the atmosphere) as a given mixture and amount of greenhouse gas. CO_2e is estimated by the summation of mass of each GHG multiplied by its global warming potential (global warming potentials: CO_2 = 1, CH_4 = 21, N_2O = 310, etc.).[6]

Construction
Based on the same assumptions made for the criteria pollutant estimates, approximately 430 metric tons of CO_2e per facility would be generated from all construction activity including: grading, site preparation, paving, equipment installation, and construction and worker vehicles. Thus, since there are 134 facilities, there will be approximately 57,597 CO_2e from the proposed project. Amortized over 30 years as prescribed by the SCAQMD Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans adopted by the SCAQMD Governing Board in December 2008, approximately 1,920 metric tons of CO_2e emissions per year (see Appendix B for calculations) would be generated from construction activities over the life of the project.

[6] California Air Resource Board Conversion Table: http://www.arb.ca.gov/cc/facts/conversiontable.pdf

Operation

The operation of the HEPA filters, oxidation catalysts, Baghouses, DPFs, and wet scrubbers are not expected to generate greenhouse gases as the equipment control emissions with no secondary emissions impacts. However, the operation of the Thermal Oxidizers, Carbon Adsorbers, and delivery/disposal trucks are equal to 4,538.56 metric tons of CO2e per year.

Total GHG Emissions

The PARs may result in the generation of 1,920 amortized metric tons of CO2e construction emissions per year and 4538.56 metric tons of CO2e operational emissions per year. The addition of 6,458.56 metric tons of CO2e emissions is less than the SCAQMD significance threshold of 10,000 metric tons per year for CO2e from industrial projects.

Conclusion

Based upon these considerations, the proposed project would not generate significant adverse construction or operational air quality impacts and, therefore, no further analysis is required or necessary and no mitigation measures are necessary or required.

IV. BIOLOGICAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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 §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, 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) Conflict 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?	☐	☐	☐	☑

Significance Criteria

Impacts on biological resources will be considered significant if any of the following criteria apply:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion

IV. a), b), c), & d) No Impact. All of the affected units operating at existing facilities are located primarily in developed industrial areas, which have already been greatly disturbed and paved. These areas currently do not support riparian habitat, federally protected wetlands, or migratory corridors. Additionally, special status plants, animals, or natural communities are not expected to be found within close proximity to the affected facilities. Therefore, the proposed project would have no direct or indirect impacts that could adversely affect plant or animal species or the habitats on which they rely in the SCAQMD's jurisdiction. While some of the APCDs may be located at new facilities, the rule amendment does not cause the new facilities to be build. Construction of the required APCDs in itself would not have any impact on plants or animals beyond the impact of construction and operating a new source itself. The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions. A conclusion in the Final Program EIR for the 2012 AQMP was that population growth in the region would have greater adverse effects on plant species and wildlife dispersal or migration corridors in the basin than SCAQMD regulatory activities, (e.g., air quality control measures or regulations). In addition, by reducing air pollutants, biological resources will benefit. Accordingly, these impact are considered insignificant.

IV. e) & f) No Impact. The proposed project is not envisioned to conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans. 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. Additionally, the proposed project will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan, and would not create divisions in any existing communities because all activities associated with complying with the proposed project will occur at existing industrial facilities. Accordingly, these impact issues are considered insignificant.

Based upon these considerations, significant biological resources impacts are not expected from implementing the proposed project, and thus, this topic will not be further analyzed in the Draft EA. Since no significant biological resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

V. CULTURAL RESOURCES.

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

Significance Criteria

Impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

DISCUSSION

V. a) No Impact. There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Since construction-related activities associated with the implementation of the proposed project are expected to be confined within the existing footprint of the affected facilities that either have been fully developed and paved, or will be developed regardless of whether the project is approved, no impacts to historical resources are expected to occur as a result of implementing the proposed project. Accordingly, this impact issue is not significant.

V. b), c), & d) Installing or modifying add-on controls and other associated equipment to comply with the proposed project may require disturbance of previously disturbed areas at the affected existing industrial facilities. However, since construction-related activities are expected to be confined within the existing footprint of the affected facilities that have been fully developed and paved, or will be regardless of whether the project is approved, the proposed project is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that these areas are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed. As noted in Section IV, the project does not cause new source construction, regardless, this will occur whether or not the project is approved. Therefore, 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. The proposed project is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the District. Accordingly, these impacts are not significant.

Based upon these considerations, significant cultural resources impacts are not expected from implementing the proposed project. Since no significant cultural resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

VI. ENERGY.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Conflict with adopted energy conservation plans?	☐	☐	☐	☑
b) Result in the need for new or substantially altered power or natural gas utility systems?	☐	☐	☑	☐
c) Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☐	☑	☐
d) Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☐	☑	☐
e) Comply with existing energy standards?	☐	☐	☐	☑

Significance Criteria
Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:
- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

DISCUSSION
VI. a) & e) The PARs do not require any action which would result in any conflict with an adopted energy conservation plan or violation of any energy conservation standard. The PARs are not expected to conflict with adopted energy conservation plans because existing facilities would be expected to continue implementing any existing energy conservation plans.

The PARs are not expected to cause new development. The local jurisdiction or energy utility sets standards (including energy conservation) and zoning guidelines regarding new development and will approve or deny applications for building new equipment at the affected facility. During the local land use permit process, the project proponent may be required by the local jurisdiction or energy utility to undertake a site-specific CEQA analysis to determine the impacts, if any, associated with the siting and construction of new development.

As a result, the PARs would not conflict with energy conservation plans, use non-renewable resources in a wasteful manner, or result in the need for new or substantially altered power or natural gas systems.

VI. b), c) & d.
There may be an increase in electricity consumption associated with the new APC equipment. Diesel fuel would be consumed by construction equipment. Gasoline fuel would be consumed by the construction workers vehicles. Natural gas fuel would be consumed by the new Thermal Oxidizers. The following sections evaluate the various forms of energy sources affected by the proposed project.

Construction-Related Impacts

PROJECT-SPECIFIC IMPACT: During the construction phases, diesel and gasoline fuel will be consumed in construction equipment portable equipment (e.g., generators and compressors) used to weld, cut, and grind metal structures and by construction workers' vehicles traveling to and from construction sites. To estimate "worst-case" energy impacts associated with the construction phases of the proposed project, the SCAQMD assumed that portable equipment used to weld, cut, and grind metal structures would be operated up to 500 hours in a year (8 hours per day for 60 days). The reader is referred to Appendix B for the assumptions used by the SCAQMD to estimate fuel usage associated with the implementation of the proposed amendments.

To estimate construction workers' fuel usage per commute round trip, the SCAQMD assumed that workers' vehicles would get 20 miles to the gallon and would travel 40 miles round trip to and from the construction site in one day. Table 2-9 lists the projected energy impacts associated with the construction and installation at the two affected facilities at any given time.

Table 2-9 Total Projected Fuel Usage for Construction Activities

Fuel Type	Year 2012 Projected Basin Fuel Demand[a] (mmgal/yr)	Fuel Usage[b] (mmgal/yr)	Total % Above Baseline	Exceed Significance?
Diesel	524	0.0014	3.0E-10	No
Gasoline	5,589	0.012	2.1E-12	No

[a] Figures taken from Table 3.3-3 of the 2012 AQMP Final EIR
[b] Estimated peak fuel usage from the implementation of the proposed amendments. Diesel usage estimates are based on portable construction equipment operation. Gasoline usage estimates are derived from workers' vehicle daily trips to and from work.

Operational Energy Impacts

PROJECT-SPECIFIC IMPACT: Any operational natural gas impacts associated with implementing the proposed amendments are attributable to fuel consumed in thermal oxidizers used by affected facilities to reduce toxic risk. According to Table 2-3, approximately five thermal oxidizers could use some type of oxidation device to comply with the risk reduction requirements in the PARs. To estimate natural gas fuel usage from thermal oxidizer operation, the SCAQMD assumed that the five units (one unit per facility) would operate eight hours per day, six days per week, 52 weeks per year and fire natural gas only. At an exhaust emission flow rate of 10,000 cfm, the amount of natural gas consumed is 0.488 MMBTU/hr and 28 kW of instantaneous power.

(5 Thermal Oxidizers x 8 hrs/day x 6 days/wk x 52 wks/yr x 0.488 MMBTU/hr)/(1050 MMBTU/MMcf) = 5.8 MMcf per year or 0.11 MMcf/day

Table 2-10 lists the projected natural gas impacts associated with the operational phase of the proposed amendments. The natural gas usage from the proposed project is negligible to the demand of natural gas available in the district.

Table 2-10 Total Projected Natural Gas Usage for Thermal Oxidizer Operations

Year	Projected Regional Natural Gas Demand[a] (mmcf/day)	Project Total Natural Gas Usage[b] (mmcf/day)	Total Impact % of Capacity	Significant?
2010	493	0.11	0.022	No

[a] Figures taken from Table 3.3-6 of the 2012 AQMP Final EIR-Commercial Sector
[b] Estimated natural gas usage from the implementation of the proposed project.

Electricity Impacts
SCAQMD staff estimates there will be additional electricity usage for the new APC equipment. Electrical energy impacts associated with ancillary equipment (e.g., fans, motors, etc.) used in conjunction with the 5 thermal oxidizers, 16 HEPA filters, 96 baghouses, 8 carbon adsorbers, and 14 wet scrubbers will need 139 blowers and are not considered significant as shown in Table 2-11.

Table 2-11 PARs Additional Electricity Consumption

Energy	Consumption (GW-h)
Blower (100 bhp@ 0.001788 GW-h) x 139	0.25
SCAQMD District Electrical Demand[1]	113,109
Total Impact % of Capacity	**2.2E-4**
Significant?	**No**

[1]AQMP 2012 TABLE 3.3-1 2011 Electricity Use GWh (Aggregated, includes self generation and renewables)

Therefore, based on the foregoing analysis, the SCAQMD has determined that operational-related activities associated with the implementation of the proposed amendments is necessary and will not use energy in a wasteful manner; will not result in substantial depletion of existing energy resource supplies; nor will significant amounts of fuel be needed when compared to existing supplies. Thus, there are no significant adverse energy/mineral resources impacts associated with the implementation of the PARs.

Based upon these considerations, significant adverse energy impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

VII. GEOLOGY AND SOILS.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☑
• Strong seismic ground shaking?	☐	☐	☐	☑
• Seismic–related ground failure, including liquefaction?	☐	☐	☐	☑
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 on- or off-site 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 where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Significance Criteria

Impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.

- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

DISCUSSION

VII. a) Since the proposed project would result in construction activities at existing facilities located in developed industrial settings to install or modify control equipment, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. While some APCDs may be installed at new facilities, the project does not cause the new facility construction. Southern California is an area of known seismic activity. Accordingly, the installation of add-on controls at existing or new affected facilities to comply with the proposed project is expected to conform to the Uniform Building Code and all other applicable state and local building codes. As part of the issuance of building permits, local jurisdictions are responsible for assuring that the Uniform Building Code is adhered to and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation condition at the site. The Uniform Building Code requirements also consider liquefaction potential and establish stringent requirements for building foundations in areas potentially subject to liquefaction. Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated.

VII. b) Since add-on controls will likely be installed at existing developed facilities, during construction of the proposed project, a slight possibility exists for temporary erosion resulting from grading activities, if required (controls included as part of new facilities are not expected to cause erosion or excavating beyond that otherwise resulting from constructing the new facility). These activities are expected to be minor since the existing facilities are generally flat and have previously been graded and paved. Further, wind erosion is not expected to occur to any appreciable extent, because operators at dust generating sites would be required to comply with the best available control measure (BACM) requirements of SCAQMD Rule 403 – Fugitive Dust. In general, operators must control fugitive dust through a number of soil stabilizing measures such as watering the site, using chemical soil stabilizers, revegetating inactive sites, etc. The proposed project involves the installation or modification of add-on control equipment at existing facilities, so that grading could be required to provide stable foundations. Potential air quality impacts related to grading are addressed elsewhere in this EA (as part of construction air quality impacts). No unstable earth conditions or changes in geologic substructures are expected to result from implementing the proposed project. Accordingly, this impact is not considered significant.

VII. c) Since the proposed project will affect existing facilities, it is expected that the soil types present at the affected facilities will not be made further susceptible to expansion or liquefaction. Furthermore, subsidence is not anticipated to be a problem since only minor excavation, grading, or filling activities are expected occur at affected facilities. Additionally, the affected areas are not envisioned to be prone to new landslide impacts or have unique geologic features since the affected equipment units are located at existing facilities in industrial areas. Controls installed at new facilities would not increase these risks beyond those resulting from the new facility itself. Accordingly, this impact is not considered significant.

VII. d) & e) Since the proposed project will affect equipment units at existing facilities located in industrial zones, it is expected that people or property will not be exposed to new impacts related to expansive soils or soils incapable of supporting water disposal. Further, typically each affected facility has some degree of existing wastewater treatment systems that will continue to be used and are expected to be unaffected by the proposed project. Sewer systems are available to handle wastewater produced and treated by each affected facility. Each existing facility affected by the proposed project does not require installation of septic tanks or alternative wastewater disposal systems. As a result, the proposed project will not require facility operators to utilize septic systems or alternative wastewater disposal systems. Thus, implementation of the proposed project will not adversely affect soils associated with a septic system or alternative wastewater disposal system. Accordingly, these impacts are not considered significant.

Based upon these considerations, significant geology and soils impacts are not expected from the implementation of the proposed project. Since no significant geology and soils impacts were identified for any of the issues, no mitigation measures are necessary or required.

VIII. HAZARDS AND HAZARDOUS MATERIALS.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials?	☐	☐	☑	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c) Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
g) 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?	☐	☐	☐	☑
h) Significantly increased fire hazard in areas with flammable materials?	☐	☐	☑	☐

Significance Criteria

Impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

DISCUSSION

VIII. a) & b) The PARs may increase the amount of captured toxic emissions. The additional captured toxic emissions through additional air pollution control equipment would reduce the toxic emissions that are currently emitted into the air. Thus, the capture of these emissions would reduce toxic exposure to the public and the environment.

Oxidation systems can be susceptible to compressor failure and flame flashbacks, particularly during startup and shutdown. As a result, oxidation systems could pose potential hazard risks primarily to workers or to a lesser extent the public in the event of explosions or fires. Oxidation systems historically have a good safety record when operated properly according to the manufacturers' instruction. Proper tune-up and maintenance is also important and necessary to avoid failures or explosions. When installed, operated, and maintained properly, oxidation systems are not expected to create fire or explosion hazards to workers or the public in general.

Operation of a carbon adsorption control system has potential hazard risks, primarily during the desorption cycle when there is a slight risk of explosion or release of VOC into the atmosphere. Carbon adsorption systems may also represent a fire risk during operation when carbon particles are saturated with solvent. Although most halogenated hydrocarbons have low flammability potential, use of such solvents is expected to decrease due to implementation of regulations to prevent global warming and stratospheric ozone depletion. Therefore, fire risks associated with carbon adsorption systems could differ depending upon the solvents used in place of halogenated compounds. Further, hazard risks would depend on the flammability of the material, concentration of VOC adsorbed into the activated carbon, ambient oxygen levels, characteristics of the specific system, and the operating conditions. Additionally, use of carbon adsorption units may concentrate hazardous organic compounds into the spent carbon, requiring recycling or disposal. This practice may generate environmental hazards during handling and disposal.

The risk of explosion or release of VOC from carbon adsorption systems is not expected to be significant. The engineering specifications for a carbon adsorption unit are typically designed to guard against risks by including an energy balance, which is an acceptable range of temperatures for the carbon bed. Good engineering practice means this range of temperatures should not exceed the lower explosive limit (LEL) of the compound(s) being adsorbed. There is little risk of fire if the LEL is not exceeded.

In addition to following good engineering practice for both thermal oxidizers and carbon adsorption systems, Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in the emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

* Identification of individuals who are responsible for various actions, including reporting, assisting emergency response personnel and establishing an emergency response team;

* Procedures to notify the administering agency, the appropriate local emergency rescue personnel, and the California Office of Emergency Services;

* Procedures to mitigate a release or threatened release to minimize any potential harm or damage to persons, property or the environment;

* Procedures to notify the necessary persons who can respond to an emergency within the facility;

* Details of evacuation plans and procedures;

* Descriptions of the emergency equipment available in the facility;

* Identification of local emergency medical assistance; and

* Training (initial and refresher) programs for employees in:

    1. The safe handling of hazardous materials used by the business;

    2. Methods of working with the local public emergency response agencies;

    3. The use of emergency response resources under control of the handler;

    4. Other procedures and resources that will increase public safety and prevent or mitigate a release of hazardous materials.

In general, every county or city and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area.

Further, all hazardous materials are expected to be used in compliance with established OSHA or Cal/OSHA regulations and procedures, including providing adequate ventilation, using recommended personal protective equipment and clothing, posting appropriate signs and warnings, and providing adequate worker health and safety training.

When taken together, the above regulations provide comprehensive measures to reduce hazards of explosive or otherwise hazardous materials. Compliance with these and other federal, state and local regulations and proper operation and maintenance of equipment should ensure the potential for explosions or accidental releases of hazardous materials is not significant.

Therefore, the PARs are not expected to create a significant hazard to the public or environment through reasonably foreseeable upset conditions involving the release of hazardous materials into the environment.

VIII. c) It is not known if schools are located within a quarter mile of the affected facilities. However, it is expected that these facilities near schools are taking the appropriate and required actions to ensure proper handling of hazardous or acutely hazardous materials, substances or wastes within one-quarter mile of an existing or proposed school.

VIII. d) Government Code §65962.5 refers to hazardous waste handling practices at facilities subject to the Resources Conservation and Recovery Act (RCRA). It is not known if the affected facilities are subject to RCRA. However, it is expected that these facilities are taking the appropriate and required actions to ensure proper handling of hazardous or acutely hazardous materials, substances or wastes.

VIII. e) The PARs would result in the reduction of toxic emissions. It is not known if some of the facilities affected by the proposed project are located at sites within an airport land use plan, or within two miles of a public airport. However, the addition of new or modification of existing toxic control equipment would not expose people residing or working in the project area to the same degree of the existing settings associated with airplanes. Therefore, the PARs are not expected to result in a safety hazard for people residing or working in the project area even within the vicinity of an airport.

VIII. f) Emergency response plans are typically prepared in coordination with the local city or county emergency plans to ensure the safety of the public (surrounding local communities), and the facility employees as well. The proposed project would not impair implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan. It is expected that the existing affected facilities already have an emergency response plan in place, where required. The addition of air pollution control equipment is not expected to require modification of the existing emergency response plan at the affected facilities. Thus, the PARs are not expected to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

VIII. g) It is not known if the affected facilities are adjacent to wildland. However, it is expected that these facilities are taking the appropriate and required actions to ensure proper handling of hazardous or acutely hazardous materials, substances or wastes, so potential for a wildland fire from the proposed project does not exist.

VIII. h) The Uniform Fire Code and Uniform Building Code set standards intended to minimize risks from flammable or otherwise hazardous materials. Local jurisdictions are required to adopt the uniform codes or comparable regulations. Local fire agencies require permits for the use or storage of hazardous materials and permit modifications for proposed increases in their use. Permit conditions depend on the type and quantity of the hazardous materials at the facility. Permit conditions may include, but are not limited to, specifications for sprinkler systems, electrical systems, ventilation, and containment. The fire departments make annual business inspections to ensure compliance with permit conditions and other appropriate regulations. Further, businesses are required to report increases in the storage or use of flammable and otherwise hazardous materials to local fire departments. Local fire departments ensure that adequate permit conditions are in place to protect against potential risk of upset. The proposed project would not change the existing requirements and permit conditions.

The proposed project would also not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees. No substantial or native vegetation typically exists on or near the affected facilities (specifically because such areas could allow the accumulation of fugitive lead dust), the existing rule requires the encapsulating (paving or asphalting) of all facility grounds. So the proposed project is not expected to expose people or structures to wild fires. Therefore, no significant increase in fire hazards is expected at the affected facilities associated with the proposed project.

Based upon these considerations, significant adverse hazards and hazardous materials impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

IX. HYDROLOGY AND WATER QUALITY.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards, waste discharge requirements, exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, or otherwise substantially degrade water quality?	☐	☐	☑	☐
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 which 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, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off-site or flooding on- or off-site?	☐	☐	☑	☐
d) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑	☐
e) Place housing or other structures 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, which would impede or redirect flood flows?	☐	☐	☐	☑
f) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding	☐	☐	☐	☑

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
as a result of the failure of a levee or dam, or inundation by seiche, tsunami, or mudflow?				
g) Require or result in the construction of new water or wastewater treatment facilities or new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
h) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑	☐
i) 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?	☐	☐	☑	☐

Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

<u>Water Demand:</u>

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases demand for total water by more than five million gallons per day.

<u>Water Quality:</u>

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

DISCUSSION

As identified in Table 2-3, the two groups of controls that have the potential to increase water demand in the district are carbon adsorption and wet scrubbers. The removal of organic material from spent carbon from carbon adsorbers may involve the use of a steam stripping application. The steam/organic mixture is vented to a condenser where the mixture is cooled. The mixture can either be disposed of or the water can be separated from the organic mixture by decanting or distillation.

The absorption process involves the transfer of components from a gas stream into a liquid form. The choice of absorbent is dependent on the physical properties of the pollutants to be controlled. Water can be used as an absorbent media for soluble gases. There are typically two modes of operation for an absorption process: simple and reclaiming/recycling. The simple process uses a single-liquid-pass system, where the water containing the toxic emission is disposed of directly after exiting the absorber. The water absorbent would need to be replaced periodically. In the complex process, the toxic component is removed or stripped from the water, and the water is recirculated into the system. In order for an absorption process to function efficiently, a certain volume of the water/toxic solution must be removed at a steady rate. The portion that is removed, which is termed the wet scrubber blowdown, constitutes the wastewater component of the process. The water that is removed must also be replaced.

Staff has identified 22 new wet scrubbers or carbon adsorption systems to comply with the proposed amendments. For the purposes of this analysis, an average emission exhaust flowrates was evaluated to estimate potential water demand generated by the proposed amendments. The flowrate evaluated are 10,000 CFM (Table 2-12).

If all of the 22 APCDs are assumed to have operations that require control equipment to handle a flowrate of 10,000 CFM, as much as 226,000 gallons per day [0.22 million gallons per day (MMgal/day)] would be needed for all 22 APCDs. This incremental daily increase in water demand anticipated for the PARs is negligible (7.1E-7%) compared to the total district supply of 9.8 million acre-feet (MAF) or 3,193,344 million gallons for 2012. Further, this incremental increase in water demand does not exceed the SCAQMD's significance threshold of potable water 262,820 gallons per day and total water of 5,000,000 gallons per day and, therefore, is not considered to be significant.

Table 2-12 Wastewater Discharge Volumes/Freshwater Demand From Carbon Adsorption and Wet Scrubbing

	AVERAGE SYSTEM FLOWRATE
WASTEWATER STREAM TYPE	**10,000 CFM**
Wet Scrubber blowdown (MMgal/day)[a]	0.039 - 0.214
Wet Scrubber sludge dewatering (MMgal/day)[b]	0.005
Carbon Adsorption stream stripping condense (MMgal/day)[c]	0.0004 – 0.0006
Total Wastewater discharge (MMgal/day)[d]	0.044 – 0.220

a Assumes 0.75 - 3.7 gal min per 1,000 CFM recirculation rate, 10 percent blowdown, fourteen units.

b Assumes wet scrubber dewatered sludge 20 percent solids, 90-98 percent control efficiency.

c Assumes 3/8 - 1/2 gal water per pound VOC collected, eight units

d Equal to additional freshwater demand.

IX. a) The PARs are not expected to alter any existing wastewater treatment requirements or otherwise substantially degrade water quality that the requirements are meant to protect because the small volume expected through the APCDs should not warrant a modification to their existing permit.

IX. b) The PARs would not require the use of groundwater. The facilities use potable water that is treated in their respective on-site wastewater treatment, reused, and then directed to the sanitary sewer. Therefore, it would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

IX. c) & d) The PARs is a proposed project that is not expected to have significant adverse effects on any existing drainage patterns, or cause an increase rate or amount of surface runoff water that would exceed the capacity of the facilities' existing or planned storm water drainage systems.

IX. e) & f) The PARs do not include or require any new or additional construction activities to build additional housing that could be located in 100-year flood hazard areas. Similarly, the sources affected by the proposed project are located at existing commercial or industrial facilities. Hence, the PARs are not expected to result in placing housing in 100-year flood hazard areas that could create new flood hazards. Therefore, the PARs are not expected to generate significance impacts regarding placing housing in a 100-year flood zone.

For the same reasons as those identified in the preceding paragraph, PARs are not expected to create significant adverse risk impacts from flooding as a result of failure of a levee or dam or inundation by seiches, tsunamis, or mudflows because the proposed project does not require levee or dam construction, and the affected facilities are located on flat land far from the ocean.

IX. g) The potential increase in wastewater volume generated by the proposed amendments is well within the existing and projected overall capacity of POTWs in the district. Therefore, wastewater impacts associated with the disposal of waterborne clean-up waste material generated from implementing the proposed amendments are not expected to significantly adversely affect POTW operations.

IX. h) SCAQMD staff estimates the additional water usage from the affected facilities would be negligible (see the above Discussion). Therefore, the PARs new APCDs water demand can be met.

IX. i) Carbon adsorbers and wet scrubbers are control technologies that can generate a hazardous liquid that could be identified as a hazardous waste depending upon the concentrations of its chemical components. If these liquids were to be discharged as a result of an equipment failure or accidental release, the hazardous material could migrate into groundwater supplies or travel into surface waters. If it is assumed that all of the water demand estimated in the proceeding water demand subsection ended up as wastewater, then a maximum volume of 0.426 MMgal of waste water could be generated on a daily basis. It is anticipated that facilities would not need to change their waste water permits due to the proposed project. Thus, no significant adverse impacts from wastewater.

It is not anticipated that the estimated amount of wastewater would create significant adverse groundwater or surface water quality impacts for a number of reasons. First, as explained in the "Geophysical Impacts" section, there are a number of state and federal laws regulating USTs and above-ground storage tanks that eliminate or minimize the possibility of accidental leaks from wastewater-containing storage vessels.

Activated carbon is often used as a method of removing organics from wastewater streams, with the organic waste either recovered and reused, or destroyed by oxidation (Fu, 1993). If regenerative carbon adsorption equipment is used, the solvent is normally recovered rather than requiring disposal. In the case of adsorption-incineration processes, the solvent is destroyed and never enters the waste stream.

In the case of once-through adsorption, spent canisters are typically returned to the supplier for regeneration by a treatment, storage and disposal facility (TSDF). These facilities are subject to strict regulatory limits for contaminated wastewater treatment. The regulatory wastewater discharge limit for wastewater from carbon regeneration by TSDFs is 1 mg/liter of total toxic organics. To ensure compliance with the 1.0 mg/liter limit, local sanitation districts monitor wastewater discharges using EPA Test Methods 601 or 602 (Lum, 1989).

Based upon these considerations, significant adverse hydrology and water quality impacts are not anticipated from the proposed project. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

X. LAND USE AND PLANNING.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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 the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑

Significance Criteria

Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by local jurisdictions.

DISCUSSION

X. a) No Impact. The proposed project does not require the construction of new facilities, but any physical effects that will result from the proposed project, will occur at existing facilities located in commercial/industrial areas and would not be expected to go beyond existing boundaries. Thus, implementing the proposed project will not result in physically dividing any established communities.

X. b) No Impact. There are no provisions in the proposed project 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 will be altered by the proposed project. Further, the proposed project would be consistent with the typical industrial zoning of the affected facilities. Typically, all proposed construction activities are expected to occur within the confines of the existing facilities. The proposed project 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. Further, no new development or alterations to existing land designations will occur as a result of the implementation of the proposed project. Therefore, present or planned land uses in the region will not be affected as a result of implementing the proposed project.

Based upon these considerations, significant land use planning impacts are not expected from the implementation of the proposed project. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

XI. MINERAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☑

Significance Criteria

Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:

- The project would 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.
- The proposed project results 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.

DISCUSSION

XI. a) & b) No Impact. There are no provisions in the proposed project that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state such as aggregate, coal, clay, shale, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Based upon these considerations, significant mineral resource impacts are not expected from the implementation of the proposed project. Since no significant mineral resource impacts were identified for any of these issues, no mitigation measures are necessary or required.

XII. NOISE.

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

Significance Criteria

Impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion

XII. a), b), & c) Less Than Significant Impact. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. Construction activities associated with implementing the proposed project may generate some noise associated with the use of construction equipment and construction-related traffic temporary and minor construction so not expected to take a long period of time. However, noise from the proposed project is not expected to produce noise in excess of current operations at each of the existing facilities. If toxic control devices are installed or existing devices are modified, the operations phase of the proposed project may add new sources of noise to each affected facility. However, control devices are not typically equipment that generate substantial amounts of noise.

Nonetheless, for any noise that may be generated by the control devices, it is expected that each facility affected will comply with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. These potential noise increases are expected within the allowable noise levels established by the local noise ordinances for industrial areas, and thus are expected to be less than significant. Therefore, less than significant noise impacts are expected to result from the operation of the proposed project.

XII. d) Less Than Significant Impact. It is not known where the future affected facilities will be located, although some of the existing affected facilities could be located at sites within an airport land use plan, or within two miles of a public airport. However, the addition of new or modification of existing toxic control equipment would not expose people residing or working in the project area to the same degree of excessive noise levels associated with airplanes because APCDs are not typically noise generating equipment. All noise producing equipment must comply with local noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. Therefore, less than significant noise impacts are expected to occur at sites located within an airport land use plan, or within two miles of a public airport.

Based upon these considerations, significant noise impacts are not expected from the implementation of the proposed project. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

XIII. POPULATION AND HOUSING.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Significance Criteria

Impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

DISCUSSION

XIII. a) and b) The construction activities associated with the proposed project at each affected facility are not expected to involve the relocation of individuals, require new housing or commercial facilities, or change the distribution of the population. The reason for this conclusion is that operators of affected facilities who need to perform any construction activities to comply with the proposed project can draw from the large existing labor pool in the local southern California area. Further, it is not expected that the installation of new or the modification of existing toxic control equipment will require new employees during operation of the equipment. In the event that new employees are hired, it is expected that the number of new employees at any one facility would be small. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing the proposed project. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth or displace people in the district or population distribution.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project. Since no significant population and housing impacts were identified for any of these issues, no mitigation measures are necessary or required.

XIV. PUBLIC SERVICES.

Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government 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:	**Potentially Significant Impact**	**Less Than Significant With Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Fire protection?	☐	☐	☑	☐
b) Police protection?	☐	☐	☑	☐
c) Schools?	☐	☐	☐	☑
d) Other public facilities?	☐	☐	☐	☑

Significance Criteria
Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion
XIV. a) & b) Less Than Significant Impact. Implementation of the proposed project is expected to cause facility operators to install new or modify existing toxic emissions control devices, all the while continuing current operations at existing affected facilities. The proposed project may result in a greater demand for catalyst, scrubbing agents and other chemicals, which will need to be transported to the affected facilities to support the function of toxic emissions control equipment and stored onsite prior to use. As first responders to emergency situations, police and fire departments may assist local hazmat teams with containing hazardous materials, putting out fires, and controlling crowds to reduce public exposure to releases of hazardous materials. In addition, emergency or rescue vehicles operated by local, state, and federal law enforcement agencies, police and sheriff departments, fire departments, hospitals, medical or paramedic facilities, that are used for responding to situations where potential threats to life or property exist, including, but not limited to fire, ambulance calls, or life-saving calls, may be needed in the event of an accidental release or other emergency. While the specific nature or degree of such impacts is currently unknown, the affected facilities have existing emergency response plans so any changes to those plans would not be expected to dramatically alter how emergency personnel would respond to an accidental release or other emergency. In addition, due the low probability and unpredictable nature of accidental releases, the proposed project is not expected to increase the need or demand for additional public services (e.g., fire and police departments and related emergency services, et cetera) above current levels.

XIV. c) No Impact. As noted in the previous "Population and Housing" discussion, the proposed project is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at affected facilities and operation of new or modified toxic emissions control equipment is not expected to require additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

XIV. d) No Impact. The proposed project is expected to result in the use of new or modified add-on control equipment for toxic control. Besides permitting the equipment or altering permit conditions by the SCAQMD, there is no need for other types of government services. The proposed project 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. There will be no increase in population and, therefore, no need for physically altered government facilities.

Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed project. Since no significant public services impacts were identified for any of these issues, no mitigation measures are necessary or required.

XV. RECREATION.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a)	Would the project 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)	Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment or recreational services?	☐	☐	☐	☑

Significance Criteria

Impacts to recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

DISCUSSION

XV. a) & b) No Impact. As discussed earlier under the topic of "Population and Housing," there are no provisions in the proposed project that would affect or increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities that might have an adverse physical effects on the environment because the proposed project will not directly or indirectly increase or redistribute population. Based upon these considerations, including the conclusion of "no impact" for the topic of "Population and Housing," significant recreation impacts are not expected from implementing the proposed project. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

XVI. SOLID/HAZARDOUS WASTE.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑	☐

Significance Criteria
The proposed project impacts on solid/hazardous waste will be considered significant if the following occurs:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

DISCUSSION
XVI.a) Landfills are permitted by the local enforcement agencies with concurrence from the California Department of Resources Recycling and Recovery (CalRecycle). Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. The PARs would generate additional waste from the disposal of contaminated concrete and soils that is discussed in further detail in the following paragraphs.

One way to evaluate sold/hazardous waste impacts is to determine if the proposed project or any components therein will result in a need for new landfill capacity. Because affected facilities may install control equipment or implement process changes that could increase the waste products in the form of liquid or solids, implementing the proposed amendment may have solid hazardous waste impacts. As noted in Table 2-3, operation of control equipment such as filters, carbon adsorption, and wet scrubbers could have solid waste impacts.

Assumptions Used in The Solid Waste Analysis

This analysis of solid waste impacts assumes that safety and disposal procedures required by various agencies in the state of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of state and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous wastes by incorporating source reduction technologies to reduce the volume or toxicity of wastes generated, including improving operating procedures, using less hazardous or nonhazardous substitute materials, and upgrading or replacing inefficient processes.

Carbon Adsorption

The amount of solid waste that may be generated by the carbon adsorption process would depend on the number of carbon adsorber installed, the operating characteristics, and frequency of carbon replacement. Disposal of spent carbon could adversely affect solid waste disposal facilities because increased quantities of waste may be generated. In addition, spent carbon may be considered hazardous waste depending on the constituents present and their concentrations, which may require disposal in a Class I landfill.

Only eight carbon adsorbers may be installed to comply with the PARs. Table 2-13 outlines the annual solid waste estimates from the disposal of spent carbon from those facilities installing carbon adsorbers to comply with the proposed amendments. It should be noted that the amounts of solid waste generated (Table 2-13) substantially overestimates solid waste impacts because most carbon is regenerated in a rotary kiln and reused. The rotary kiln typically consumes five percent of the carbon in the process, which has to be replaced. Therefore, no significant adverse solid waste impact is anticipated from the disposal of spent carbon.

Table 2-13 Estimates of Solid Waste from Carbon Adsorption

Process Exhaust Rate	5,000 CFM	10,000 CFM	20,000 CFM
Solid Waste Quantity:			
Carbon adsorption (spent carbon) (tons/yr)[a]	1,136	1,136	1,136

a Based on total emissions of 71 ton/yr for low and medium boiling point VOC and carbon replacement rate 2-lb carbon/lb VOC per year, assuming 5-year bed life, eight permit units.

Wet Scrubbing

It is estimated that fourteen wet scrubbers may be installed as a control option to comply with the proposed amendments. Assuming a 98 percent control efficiency, wet scrubbing of all metal compounds would be expected to generate a maximum volume of 128.8 tons per year (9.2 tons per year per wet scrubber x 14 facilities) of hazardous solids and dewatered sludge. Based on the types of facilities that would install wet scrubbers, it is likely that this waste would be concentrated with metals and would most likely need to be disposed of as a hazardous waste in a Class I landfill.

Filtration

Filtration includes usage of baghouse, HEPA filters and DPFs. All mixed metal compounds could be generated with the use of filtration controls at a 99.9 percent control rate. It is likely that the majority of the approximately 224.2 tons per year of minerals and silica (118 filtration systems x 1.9 tons per year per filter) that could potentially be generated by filtration devices would be used as land cover at a solid waste, Class II landfill. Otherwise, if traces of asbestos, etc. are found, the filter would need to be disposed in a Class I landfill.

Depending upon what type of control equipment is used, the total quantity of waste requiring disposal in a Class I landfill that may be generated from the disposal of spent carbon, minerals and metal compounds is 1.9 tons per day (or 410.5 tons per year). Currently, there are three Class I landfills in California: Laidlaw Environmental in Westmoreland, Imperial County; Chemical Waste Management Corporation in Kettleman Hills, Kings County; and Laidlaw Environmental, in Buttonwillow, Kern County. According to SCAQMD's 2012 AQMP, the total available capacity of each of these landfills ranges from 83,425 cubic yards (or 116,796 tons per day). With an annual disposal of 1,489 tons of carbon beds, filters, etc., the total solid/hazardous waste impact from the proposed amendments ranges from 0.0035 percent of the available Class I landfill capacity. The amount of hazardous waste generated by the proposed project will not require new Class I landfills and is not considered to be a substantial impact to existing landfill capacity. Therefore, potential hazardous waste impacts are not considered significant.

Table 2-14 Total Solid Waste Generation

Control Type	Potential # APC Devices	Annual Waste per Control Device (tons/year)	Total Waste Generated (tons/year)
Carbon adsorption	8	142	1,136
Wet Scrubbing	14	9.2	128.8
Filtration	118	1.9	224.2
TOTAL WASTE GENERATED FROM PROPOSED PROJECT			**1,489 tons/yr or 4.08 tons/day**

XVI.b) It is assumed that facility operators at the affected facilities comply with all applicable local, state, or federal waste disposal regulations.

Implementing the PARs is not expected to interfere with any affected facility's ability to comply with applicable local, state, or federal waste disposal regulations. Since no solid/hazardous waste impacts were identified, no mitigation measures are required or necessary.

Based upon these considerations, significant adverse solid/hazardous waste impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

XVII. TRANSPORTATION/TRAFFIC.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☑
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards 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 due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☑

Significance Criteria
Impacts on transportation/traffic will be considered significant if any of the following criteria apply:
- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees.
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day.
- Increase customer traffic by more than 700 visits per day.

DISCUSSION
XVII. a) & b)
Construction
As noted in the "Discussion" sections of the other environmental topics, compliance with the PARs are expected to require construction activities for control equipment. It has been estimated to need 8 delivery and/or disposal trucks and 8 construction worker trips on a peak construction day (during the fill phases). Construction onsite is not expected to affect on-site traffic or parking. The additional 16 construction trips are less than the significance threshold of 350 round trips, therefore construction activities are not expected to cause a significance adverse impact to traffic or transportation.

Operation
Waste products may be generated from the use of several types of control technologies. Wastes could include: spent carbon generated from the carbon adsorption process; spent metal catalysts from the catalytic oxidation process; solids and sludge from wet scrubbers; and dry solids from filtration controls. The majority of wastes will likely need to be transported to disposal or recycling facilities. The catalysts in catalytic oxidizers need to be replaced every few years so this potential waste product was considered to contribute to the waste transport impacts.

For a "worst case" analysis, SCAQMD staff assumed that for the 134 facilities required to install a control device to comply with the PARs, these facilities at any given day would generate an additional 2 truck trips per day in the entire district additional for delivery and disposal. These potential truck trips are not expected to significantly adversely affect circulation patterns on local roadways or the level of service at intersections near affected facilities. In addition, this volume of additional daily truck traffic is negligible over the entire area of the district. Finally, the number waste disposal transport trips substantially overestimates the number of anticipated trips because owners/operators at affected facilities may use other types of add-on control equipment that do not generate wastes and the actual volume of wastes is expected to much less than estimated here, resulting in fewer truck trips per day.

Table 2-15 Estimation of Vehicle Trips

Phase	Worker Vehicles	Delivery/Disposal Trucks
Construction	4/day	3 per day[a]
Operation	N/A	2 per day[b]

[a] A maximum of 4 worker vehicles and 3 delivery/disposal trucks per day were estimated from two affected facilities peak construction

[b] A maximum of 2 delivery/disposal trucks can travel in the District for the 134 Affected Facilities

XVII. c) It is not known whether the location of existing or future affected facilities could be located at sites within an airport land use plan, or within two miles of a public airport. However, the addition of new or modification of existing toxic control equipment at ground level facilities is not expected to change the air traffic patterns or change in location that results in substantial safety risks.

XVII. d) & e) The proposed project does not involve construction of any roadways or other transportation design features, so there would be no change to current roadway designs that could increase traffic hazards. Thus, the proposed project is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities. Emergency access at the affected facilities is not expected to be impacted by the proposed project. Further, each affected facility is expected to continue to maintain their existing emergency access. Since the PARs involves short-term construction activities and operational of control equipment is not expected to increase vehicle trips, the proposed project is not expected to alter the existing long-term circulation patterns. The proposed project is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur.

XVII. f) The affected facilities would still be expected to comply with, and not interfere with adopted policies, plans, or programs supporting alternative transportation (e.g. bicycles or buses). Since all of the PARs' compliance activities would occur on-site, the PARs would not hinder compliance with any applicable alternative transportation plans or policies.

Based upon these considerations, significant adverse transportation/traffic impacts are not anticipated. Therefore, no further analysis or mitigation measures are required or necessary.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
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

XVIII. a) As discussed in the "Biological Resources" section, the PARs are not expected to significantly adversely affect plant or animal species or the habitat on which they rely because any construction and operational activities associated with affected sources are expected to occur entirely within the boundaries of existing developed facilities in areas that have been greatly disturbed and that currently do not support any species of concern or the habitat on which they rely. The PARs are not expected to reduce or eliminate any plant or animal species or destroy prehistoric records of the past.

XVIII. b) Based on the foregoing analyses, the PARs would not result in significant adverse project-specific environmental impacts. Potential adverse impacts from implementing the PARs would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for any environmental topic because there are no, or only minor incremental project-specific impacts that were concluded to be less than significant. Per CEQA Guidelines §15064(h)(4), the mere existing of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulative considerable. SCAQMD cumulative significant thresholds are the same as project-specific significance thresholds.

This approach was upheld by the Court in *Citizens for Responsible Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal. App. 4th 327, 334. The Court determined that where it can be found that a project did not exceed the South Coast Air Quality Management District's established air quality significance thresholds, the City of Chula Vista properly concluded that the project would not cause a significant environmental effect, nor result in a cumulatively considerable increase in these pollutants. The court found this determination to be consistent with CEQA Guidelines §15064.7, stating, "The lead agency may rely on a threshold of significance standard to determine whether a project will cause a significant environmental effect." The court found that, "Although the project will contribute additional air pollutants to an existing nonattainment area, these increases are below the significance criteria…" "Thus, we conclude that no fair argument exists that the Project will cause a significant unavoidable cumulative contribution to an air quality impact." As in *Chula Vista*, here the District has demonstrated, when using accurate and appropriate data and assumptions, that the project will not exceed the established South Coast Air Quality Management District significance thresholds. See also, *Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 Cal. App. 4th 899. Here again the court upheld the South Coast Air Quality Management District's approach to utilizing the established air quality significance thresholds to determine whether the impacts of a project would be cumulatively considerable. Thus, it may be concluded that the Project will not cause a significant unavoidable cumulative contribution to an air quality impact.

Therefore, there is no potential for significant adverse cumulative or cumulatively considerable impacts to be generated by the proposed project for any environmental topic.

XVIII. c) Based on the foregoing analyses, the proposed project is not expected to cause adverse effects on human beings for any environmental topic because the air quality impacts were determined to be less than the significance thresholds (See Section III-AQ), the energy demand, water demand and solid waste disposal can be met utilizing existing services (See Section VI-Energy, Section IX-Hydrology and Section XVI-Solid/Hazardous Waste) and the aesthetics, noise, hazards and public services will not be significantly impacted (See Section I-Aesthetics, Section VII-Hazards, Section XII-Noise, and Section XIV-Public Services).

As previously discussed in environmental topics I through XVIII, the proposed project has no potential to cause significant adverse environmental effects. Therefore, no further analysis or mitigation measures are required or necessary.

APPENDICES

APPENDIX A

PROPOSED AMENDED RULES

Please find the final rule language in the Governing Board Package.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

Table B-1 Summary

Total On-Site for one Facility

	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOx, lb/day	CO2e, ton/year	Total GHG Amortized over 30 years for 134 facilities (CO2e/yr)
Grading/Site Preparation	11	25	4.0	1.6	2.7	0.0	13	
Paving	8	12	0.7	0.7	0.2	0.01	2	
Equipment Installation	15	30	1.4	1.3	3.4	0.0	414	
								1917

Total Daily at Two Facilities (maximum "worst case")

	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOx, lb/day	CO2e, ton/year
Grading/Site Preparation	22.9	50.4	**8.0**	**3.2**	5.4	0.1	25.2
Paving	15.0	24.0	1.5	1.3	0.5	0.0	4.6
Equipment Installation	**29.9**	**59.2**	2.9	2.6	**6.9**	**0.1**	**828.8**
Significance Threshold	550	100	150	55	75	150	100,000
Exceed Significance?	NO	NO	NO	NO	NO	NO	NO

Table B-2 Grade/Site Summary

Grading/Site Preparation -	8	days[a]

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Rubber Tired Dozers	1	7.0	4
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Emission Factors

Equipment Type[c]	CO lb/hr	NOx lb/hr	PM10 lb/hr	PM2.5 lb/hr	VOC lb/hr	SOx lb/hr	CO2 lb/hr	CH4 lb/hr	NO2 lb/hr
Rubber Tired Dozers	1.101	2.381	0.099	0.091	0.284	0.002	238	0.026	0.099
Tractors/Loaders/Backhoes	0.374	0.498	0.034	0.031	0.073	0.001	67	0.007	0.021

Fugitive Dust Bulldozer Parameters

Vehicle Speed (mph)[d]	Vehicle Miles Traveled[e]
3	21

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[f]	Mean Wind Speed[g] mph	Moisture Content[h]	Dirt Handled[i] cy		Dirt Handled[j] lb/day
0.35	10	7.9	3,413	170641	8,532,031

Construction Vehicle (Mobile Source) Emission Factors[k]

	CO lb/mile	NOx lb/mile	PM10 lb/mile	PM2.5 lb/mile	VOC lb/mile	SOx lb/mile	CO2 lb/mile	CH4 lb/mile	NO2 lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Medium-Duty Truck	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Automobile	4	20
Medium-duty Truck[l]	3	20

Incremental Increase in Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day	PM2.5 lb/day	VOC lb/day	SOx lb/day	CO2 lb/day	CH4 lb/day	NO2 lb/day
Rubber Tired Dozers	7.71	16.67	0.69	0.64	1.99	0.02	1,665	0.18	0.69
Tractors/Loaders/Backhoes	2.62	3.48	0.24	0.22	0.51	0.01	467	0.05	0.14
Total	**10.3**	**20.2**	**0.9**	**0.9**	**2.5**	**0.0**	**2,132**	**0.2**	**0.8**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Grading[m]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMTx (1 - control efficiency)
Material Handling[n] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton)
(1 -
control efficiency)

Description	Control Efficiency %	Unmitigated PM10[o] lb/day	Unmitigated PM2.5[o] lb/day
Earthmoving	61	2.3	0.475
Material Handling	61	0.67	0.141
Total		**2.9**	**0.615**

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	NO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Automobiles	0.6371	2.8971	0.0865	0.0615	0.1255	0.0058	601	0.0058	0.0410
Medium Duty Trucks	0.4779	2.1728	0.0648	0.0462	0.0941	0.0044	451	0.0044	0.0308
	1.115	**5.070**	**0.151**	**0.108**	**0.220**	**0.010**	**1,051**	**0.010**	**0.072**

Total Incremental Emissions from Construction Activities

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	metric ton/year
Emissions	**11**	**25**	**4.0**	**1.6**	**2.7**	**0.033**	**13**
Significance Threshold[p]	***550***	***100***	***150***	***55***	***75***	***150***	
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) Based on assumption that each bulldozer can move 35 cubic yards of soil per hour and one acre of area with a depth of 20 feet.

b) Estimated construction equipment assumed to operate one eight-hour shift per day.

c) Emission factors estimated using OFFROAD2011

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Two bulldozers traveling three miles per hour for seven hours per day.

f) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

g) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

i) Assuming 3412.8125 cubic yards of dirt handled (4840 ft2 x 20 ft) x yd3/27 ft3)/ days)

j) Dirt handled, lb/day = (3412.8125 yd3 x 2,500 lb/yd3)
k) Emission factors estimated using EMFAC2011 for the 2014 fleet year.
l) Assumed 30 cubic yd truck capacity for 3412.8125 cy of dirt [(3412.8125 cy x truck/30 cy) = 3 one-way truck trips/day].
m) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 μm
n) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12
o) Includes watering at least three times a day per Rule 403 (61% control efficiency)
p) SCAQMD CEQA significance thresholds

Table B-3 Paving Summary

Asphalt Paving of Foundation		
Construction Schedule	**8**	**days[a]**

Equipment Type[a]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.0	4
Cement and Mortar Mixers	1	6.0	
Rollers	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**NO2**
Equipment Type[b]	lb/hr	lb/hr	lb/hr		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Pavers	0.526	0.810	0.056	0.052	0.143	0.001	78	0.013	0.000
Cement and Mortar Mixers	0.042	0.055	0.002	0.002	0.009	0.000	7	0.001	0.000
Rollers	0.401	0.616	0.042	0.039	0.091	0.001	67	0.008	0.000

Construction Vehicle (Mobile Source) Emission Factors[c]

	CO	**NOx**	**PM10**	**PM2.5**	**VOC**	**SOx**	**CO2**	**CH4**	**NO2**
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Medium-Duty Truck	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Worker	4	20
Delivery/Disposal Truck[d]	3	20

Incremental Increase in Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Construction Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	NO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Pavers	3.68	5.67	0.39	0.36	0.1	0.00	51	0.01	0.00
Cement and Mortar Mixers	2.41	3.70	0.25	0.23	0.0	0.00	0	0.00	0.00
Rollers	0.29	0.39	0.02	0.02	0.0	0.00	0	0.00	0.00
Total	**6**	**10**	**0.66**	**0.61**	**0.06**	**0.00**	**51**	**0.01**	**0.00**

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2	CH4	NO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Worker	0.659	0.055	0.0166	0.0071	0.0720	0.0013	116.5368	0.0032	0.0008
Delivery	0.478	2.173	0.0648	0.0462	0.0941	0.0044	450.6386	0.0044	0.0308
Total	**1.137**	**2.227**	**0.0814**	**0.0532**	**0.1661**	**0.0057**	**567.1755**	**0.0076**	**0.0315**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10	PM2.5	VOC	SOx	CO2eq
Sources	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	metric ton/year
Emissions	**8**	**12**	**0.7**	**0.7**	**0.2**	**0.0**	**2.3**
Significance Threshold[e]	***550***	***100***	***150***	***55***	***75***	***150***	
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Notes:
Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units

for cell. Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) Estimated construction equipment assumed to operate one eight-hour shift per day.

b) Emission factors estimated using OFFROAD2011

c) Emission factors estimated using EMFAC2011 for the 2014 fleet year.

d) Assumed three deliver truck trips per day.

e) SCAQMD CEQA significance thresholds

Table B-4 Operational Summary

Operational

	CO lb/mile	NOx lb/mile	PM10 lb/mile	PM2.5 lb/mile	VOC lb/mile	SOx lb/mile	CO2 lb/mile	CH4 lb/mile	NO2 lb/mile
Automobile	4.12E-03	3.41E-04	1.04E-04	4.41E-05	4.50E-04	8.22E-06	0.73	2.01E-05	4.83E-06
Medium-Duty Truck[a]	3.98E-03	1.81E-02	5.40E-04	3.85E-04	7.84E-04	3.64E-05	3.76	3.64E-05	2.56E-04

Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day[i]**	**One-Way Trip Length[j] (miles)**
Worker	0	20
Medium-Duty Truck	8	20

Incremental Increase in Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day	PM2.5 lb/day	VOC lb/day	SOx lb/day	CO2 lb/day	CH4 lb/day	NO2 lb/day
Automobile	0.00	0.000	0.0000	0.0000	0.000	0.00000	0	0.0000	4.83E-06
Medium-Duty Truck	1.3	5.8	0.173	0.123	0.25	0.0116	1,202	0.0117	0.082

Total Incremental Emissions from Operational Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day	PM2.5 lb/day	VOC lb/day	SOx lb/day	CO2 metric ton/year
Emissions	**1.3**	**5.8**	**0.2**	**0.1**	**0.3**	**0.01**	**0.56**
Significance Threshold[b]	***550***	***55***	***150***	***55***	***75***	***150***	***10,000***

Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Notes:
a) Emission factors estimated using EMFAC2011 for the 2015 fleet year.

b) SCAQMD significance thresholds

Table B-5 Thermal Oxidizer Summary

Annual Emission Reporting Default Emission Factors for External Combustion Equipment

Fuel Type (fuel unit)	Organic Gases, lb/mmscf	Rule 1147 Nitrogen Oxides, lb/mmbtu	Sulfur Oxides, lb/mmscf	Carbon Monoxide, lb/mmscf	Particulate Matter, lb/mmscf	CO2, lb/mmscf	N2O, lb/mmscf	CH4, lb/mmscf
Natural Gas/ Other Equipment	7	0.073	0.6	35	7.5	120,000	0.64000	2.3

Annual Emission Reporting (AER) defaulting emission factors from B1 external combustion equipment for all criteria pollutants exempt NOx.

BACT= Rule 1147 NOx emissions limit was used.

CO2, N2O and CH4 emission factors from AP-42 Table 1.4-2, July 1998

Thermal Oxidizer Criteria Pollutant Emissions

Natural Gas Rating, mmbtu/hr	Conversion, btu/scf	Natural Gas Usage, mmscf/hr	Op Time, hr/day	ROG, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM, lb/day
2.44	1,050	0.00232	8	0.1	1.4	0.01	0.7	0.1

Natural gas rating based on engineering estimate.

Thermal Oxidizer Greenhouse Gas Emisisons

Natural Gas Usage, mmscf/yr	CO2, metric ton/year	N2O, metric ton/year	CH4, metric ton/year	CO2e, metric ton/year
20.3	1,105	0.01	0.02	1,107

Table B-6
Construction Equipment Fuel Use

Grading/Site Preparation

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Rubber Tired Dozers	2	7.0	5.2	72.8
Tractors/Loaders/Backhoes	2	7.0	1.9	26.6
				99.4

Paving

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Cranes	3	4.0	3.52	42.24
Forklifts	2	6.0	0.96	11.52
Tractors/Loaders/Backhoes	2	8.0	1.9	30.4
				84.16

Equipment Installation

Equipment Type	No. of Equipment	Op Time, hr/day	Fuel Economy, gal/hr	Fuel Used, gal/day
Pavers	1	7.0	2.8	19.6
Cement and Mortar Mixers	4	6.0		
Rollers	1	7.0	1.6	11.2
Tractors/Loaders/Backhoes	1	7.0	1.9	13.3
				44.1

Table B-7
Vehicle Fuel Use

Grading/Site Preparation

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	4	20	10	16
Medium-duty Truck	3	20	40	3
	7			

Paving

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	4	20	10	16
Medium-duty Truck	3	20	40	3

Equipment Installation

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Automobile	4	20	10	16
Medium-duty Truck	3	20	40	3

Operational

Vehicle	No. of One-Way, Trips/Day	One-Way Trip Length, miles	Fuel Economy, mpg	Fuel Used, gal/day
Medium-duty Truck	3	21	40	3

Vehicle	**No. of One-Way, Trips/Day**	**One-Way Trip Length, miles**	**Fuel Economy, mpg**	**Fuel Used, gal/day**
Automobile	32	20	10	128

ATTACHMENT I

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Socioeconomic Assessment for

Proposed Amended Rules

212 – Standards for Approving Permits and Issuing Public Notice
1401 – New Source Review of Toxic Air Contaminants
1401.1 – Requirements for New and Relocated Facilities Near Schools, and
1402 – Control of Toxic Air Contaminants from Existing Sources

May 2015

Executive Officer
Barry R. Wallerstein, D.Env.

Deputy Executive Officer
Planning, Rule Development & Area Sources
Philip M. Fine, Ph.D.

Assistant Deputy Executive Officer
Planning, Rule Development & Area Sources
Jill Whynot

Authors: Elaine Shen, Ph.D., Program Supervisor
Shah Dabirian, Ph.D., Air Quality Specialist

Technical Assistance: Michael Morris, Program Supervisor

Reviewed By: Barbara Baird, Chief Deputy Counsel
Joe Cassmassi, Planning & Rules Manager
Elaine Chang, Dr.P.H., Deputy Executive Officer (retired)
Ian MacMillan, Program Supervisor
Susan Nakamura, Director of Strategic Initiatives
William Wong, Principal Deputy District Counsel

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

EXECUTIVE SUMMARY

On March 31, 2015, the SCAQMD released a Draft Socioeconomic Report for Proposed Amended Rules (PARs) 212, 1401, 1401.1, and 1402. Since the release of the Draft Socioeconomic Report in March, the SCAQMD hosted regional Public Workshops. Based on comments received during the Regional Public Workshops, staff has revised the Draft Socioeconomic Report to identify the AB2588 facilities that would potentially need to prepare an HRA and public noticing and include the cost associated with these activities. A socioeconomic analysis was conducted to assess the impacts of PARs 212, 1401, 1401.1, and 1402, and the associated revisions to risk assessment guidelines for permitting and AB2588. A summary of the analysis and findings is presented below.

Elements of Proposed Amendments	The SCAQMD relies on health risk assessment guidelines issued by the California Office of Environmental Health Hazard Assessment (OEHHA) in various aspects of its toxics regulatory program including the permitting program, AB2588 Hot Spots Program, and existing regulatory program. On March 6, 2015, OEHHA adopted the Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines), based on new scientific information that early-life exposures to air toxics contribute to an increased lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. The proposed amended rules will revise specific references within definitions to be consistent with the Revised OEHHA Guidelines. The SCAQMD staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and the 2015 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212. The proposed amended rules do not include revisions to the health risk thresholds in Rules 1401, 1401.1 or 1402. The estimated cancer risk calculated based on the Revised OEHHA Guidelines is expected to increase even though there may be no increase in toxic emissions at a facility. Except for the proposed amendments to Rule 1402 that would apply to the existing sources of toxic air contaminants (TACs), PARs 1401, 1401.1, and 212 will apply to new, relocated, or modified sources of TACs and will not be applied retroactively. Because the Revised OEHHA Guidelines reflect revisions to the susceptibility of infants and children, the Revised OEHHA Guidelines primarily affect residential and sensitive receptors with very little change to

Elements of Proposed Amendments (cont.)	worker receptors. In fact, a slight decrease in estimated risk for the same emissions is expected for most worker receptors, due to a shorter assumed period of exposure.
Affected Facilities and Industries	PAR 1401 and 1401.1 could potentially require new or additional air pollution controls for new, relocated, or modified sources of TACs, except gas stations and spray booths. Staff estimated that five equipment source categories could potentially be affected. With the exceptions of motion picture film laboratories that are classified within the information sector (NAICS 51) and crematories within the services sector (NAICS 54-81), all other affected facilities are in the manufacturing sector (NAICS 31-33). They include metal plating, plasma arc and laser cutting, and asphalt blending and concrete batch facilities. Rule 1402 establishes facility-wide risk requirements for existing TACs-emitting facilities and implements the California AB2588 Air Toxics “Hot Spots” program. SCAQMD staff estimates, based on the most recently approved Health Risk Assessments (HRAs) for facilities in the AB2588 program, that implementation of the Revised OEHHA Guidelines could potentially require new or additional air pollution controls for 22 existing AB2588 facilities because their estimated health risk with the Revised OEHHA Guidelines could potentially be greater than 25 in a million, thus requiring risk reduction. Among them, one is classified within the services sector (NAICS 54-81), three in the utilities sector (NAICS 22), and the rest in the manufacturing sector (NAICS 31-33). In addition to the cost of pollution controls, it is estimated that 17 of the 22 facilities are expected to have to update their HRAs and incur related costs. 70 other existing AB2588 facilities, which belong to various sectors, are also expected to either have to submit HRAs for the first time or update HRAs and issue public notices. Of these 70 facilities, it is expected that 42 facilities could potentially need to conduct public notification as well. Rule 212 contains public notification requirements for new, modified, or relocated sources of TACs. Staff projects that, annually, approximately 10 to 30 new diesel emergency back-up internal combustion engines could potentially require the issuance of public notices that are attributed to the Revised OEHHA Guidelines. These new emergency back-up internal combustion engines would be employed by a wide array of industries in the private sector, as well as by the public sector.

Major Assumptions and Limitation of Analysis	The analysis herein was performed for a ten year period (2015-2024). This is mainly because PAR 1401 and 1401.1 will apply to new, relocated, or modified sources of TACs and will not be applied retroactively. Due to potential changes in basic and control technologies, as well as the costs of technologies, it would be speculative to assume that the new, relocated, or modified sources permitted further in the future would continue requiring the same types of additional controls assumed in this analysis. Based on an evaluation of the SCAQMD permits that were issued over a five year period from October 2009 to October 2014, staff estimated that 28 new or modified permits annually could potentially need additional pollution control equipment due to implementation of the Revised OEHHA Guidelines. The SCAQMD staff is assuming that the selected compliance path would be installation of pollution controls. There are other options available that many facilities may select. They include product replacement such as using materials with less or no toxic emissions, use of different fuels that are less toxic such as natural gas instead of diesel, locating the equipment at a distance to create a larger buffer between the equipment and the residential and sensitive receptors, and reduction of throughput. The availability of these alternative options depends on the specific situation at each facility. The typical pollution controls that would likely be utilized under PAR 1401, 1401.1 and 1402 are High Efficiency Particulate Arrestors (HEPA) filters for nickel plating tanks, oxidation catalysts for control of polycyclic aromatic hydrocarbons, baghouses for metal particulates, carbon adsorbers for wet gate printing and film cleaning, and diesel particulate filters on diesel engines. In addition to the aforementioned controls, scrubbers and thermal oxidizers could also be needed for some of the potentially affected AB2588 facilities due to implementation of the Revised OEHHA Guidelines. These controls are assumed to have an equipment life of six to ten years, depending on the particular type of control. The compliance costs conservatively assume that previously reported health risks and emission inventories apply today, even though they were reported in the previously approved HRAs and may not reflect the most recent status at the AB2588 facilities. Additional facilities were included where the calculated risks were near rule thresholds and emissions have remained stable or have increased. Recent changes to equipment and reductions in emission inventories were not considered.

Compliance Costs	The compliance costs estimated in the analysis are associated with additional pollution control equipment and their permitting costs, submitting or updating HRAs, and the costs of issuing additional public notices. However, they do not take into account other potential costs, such as some permitting and administrative costs, as these cost would have occurred independent of the Revised OEHHA Guidelines. The compliance costs due to PAR1401 are estimated to increase annually by an amount ranging from \$239,000 to \$255,000, depending on the real interest rate assumed (1%-4%). The compliance costs would cease to continue accumulating when lower-emission alternatives to the permit equipment become available at a competitive price. The machine tool manufacturing industry (NAICS 333517), where plasma arc and laser cutting facilities belongs, would bear the largest share of compliance costs (67%) due the number of new and modified permits assumed for this source category. The compliance costs associated with PAR 1402 are estimated as below among the existing AB2588 facilities: • 22 facilities would need to conduct risk reductions and install additional controls. The ~~estimated~~ associated total annual compliance cost is estimated to ~~would~~ range from \$1.3 million to \$1.4 million, depending on the real interest rate assumed (1%-4%). • 87 facilities would need to submit HRAs for the first time or update HRAs and incur a total one-time cost of \$2.2 million. If annualized over a period of ten years, the cost would range from \$0.2 million to \$0.3 million, using a real interest rate of 1%-4%. • 42 facilities would need to issue public notices due to the Revised OEHHA Guidelines specifically. The overall costs of public notification would add up to \$71,400. If annualized over a period of ten years, the cost would range from \$7,500 to \$8,800, using a real interest rate of 1%-4%. Together, the ~~O~~overall annualized compliance costs under PAR 1402 would range from \$1.5 million to \$1.6 million, reflecting mainly the cost of installing and operating control equipment. The costs are estimated to be approximately 25% lower if conservative assumptions are not utilized. Many industries identified as requiring HRAs or requiring risk reduction have already been actively pursuing risk reduction actions as part of their business

Compliance Costs (cont.)	plan or in anticipation of the Revised OEHHA Guidelines. Finally, the annual compliance costs due to PAR 212 are estimated to be between $17,000 and $51,000. The expenditures are to pay for the projected 10-30 public notices that would be required for new emergency engines installed by various industries annually that are estimated to be attributed to implementing the Revised OEHHA Guidelines.
Regional Job Impacts	The proposed amendments are expected to result in approximately 10 to 100 annual jobs forgone between 2015 and 2024 when it is assumed that facilities would finance capital costs of control equipment at a 4-percent real interest rate and that all equipment and services would be purchased from businesses located within the region. When a 1-percent real interest rate is assumed instead, the job impact would become less negative, with approximately 10 to 90 annual jobs foregone over the same period. However, if all equipment and services would be imported from outside the region, the number of jobs foregone would increase by about 20 percent, to approximately 20 to 120 annual jobs foregone between 2015 and 2024. In any of the scenarios analyzed above, the projected job impacts represent less than 0.001 percent of the total employment in the four-county region. The projected reduction in employment would be across all major sectors of the economy.

INTRODUCTION

The California Office of Environmental Health Hazard Assessment (OEHHA) establishes guidance for performing risk assessments for toxic air contaminants (TACs). Pursuant to AB2588, OEHHA developed and approved in 2003 the Health Risk Assessment Guidance (2003 OEHHA Guidelines) for implementation of the Hot Spots Program (Health and Safety Code Section 44360(b)(2)). Since the adoption of the 2003 guidelines, new scientific information has shown that early-life exposures to air toxics contribute to an increased lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. Based on this information, OEHHA adopted on March 6, 2015 the Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines).

The SCAQMD relies on OEHHA's health risk assessment guidelines in various aspects of its toxics regulatory program including the permitting program, AB2588 Hot Spots Program, and existing regulatory program. Amendments to the following rules are being proposed to reference the Revised OEHHA Guidelines for estimation of health risks:

- *Rule 1401 – New Source Review of Toxic Air Contaminants*, which establishes cancer and non-cancer health risk requirements for new, relocated, or modified permitted sources of toxic air pollutants.
- *Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools*, which establishes more stringent risk requirements for new and relocated facilities emitting TACs located near schools, thereby reducing the exposure of toxic emissions to school children.
- *Rule 1402 – Control of Toxic Air Contaminants from Existing Sources*, which establishes facility-wide risk requirements for existing facilities that emit TACs and implements the state AB2588 Air Toxics "Hot Spots" program.
- *Rule 212 – Standards for Approving Permits and Issuing Public Notice*, which contains public notification requirements for new, modified, or relocated sources of air contaminants.

The proposed amended rules will revise definitions and risk assessment procedures to be consistent with the Revised OEHHA Guidelines. Proposed amendments are to ensure SCAQMD staff can implement the Revised OEHHA Guidelines regarding how health risks are calculated. Staff is not recommending revisions to the health risk thresholds in Rules 1401, 1401.1 or 1402. The SCAQMD staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and the 2015 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212. (Please refer to the Staff Report for additional information).

The estimated cancer risk using the Revised OEHHA Guidelines is expected to increase even though there may be no increase in toxic emissions at a facility. The Revised OEHHA Guidelines incorporate age sensitivity factors and other changes which will increase cancer risk estimates to residential and sensitive receptors by approximately 3 times, and more than 3 times in some cases depending on whether the toxic air contaminant has multiple pathways of exposure in addition to inhalation. Except for the proposed amendments to Rule 1402 that would apply to the existing sources of TACs, the Proposed Amended Rules (PAR) 1401, 1401.1, and 212 will apply to new, relocated, or modified sources of TACs and will not be applied retroactively. Because the Revised OEHHA Guidelines reflect revisions to the susceptibility of infants and children, the Revised OEHHA Guidelines primarily affect residential and sensitive receptors with very little change to worker receptors, in fact a slight decrease is expected for most worker receptors, due to a shorter assumed period of exposure.[1]

Since the estimated cancer risk is expected to increase due to the Revised OEHHA Guidelines, it could potentially become necessary to install new or additional air pollution control equipment to comply with the existing health risk thresholds in Rules 1401, 1401.1 or 1402. Under PAR 1401 and 1401.1, five equipment source categories were identified that could potentially require additional controls for some of the new, relocated, or modified sources permitted in the future. These five categories are metal plating facilities, crematories, plasma arc and laser cutting, wet gate printing and film cleaning, and asphalt and concrete batch blending facilities.

Under PAR 1402, it is estimated that 22 existing facilities could potentially need to install additional controls, and the majority of them would also need to update their Health Risk Assessments (HRAs). These identified facilities belong to various industries, including aerospace, asphalt manufacturing, hospital, metal forging and heat treating, metal melting, metal plating and finishing, petroleum refining, and waste management. These facilities were identified based on health risks from previously approved HRAs and the increase in estimated health risk using the Revised OEHHA Guidelines. It should be noted that some of the approved HRAs are more than ten years old, so it is likely that changes within the facility could have occurred that would have reduced the overall health risk at the facility. Actual determination of the need for risk reductions will be made on a case-by-case basis utilizing the most recent data available. Moreover, under PAR 1402, 42 additional existing facilities are expected to need to update their HRAs and conduct public notification, and 28 could potentially need to submit HRAs for the first time. Most of these facilities are in the manufacturing and utilities sectors.

In addition, the expected increase in estimated cancer risk due to implementing the Revised OEHHA Guidelines could also potentially increase the number of Rule 212 notices. Staff projects that 10 to 30 additional notices will be required on a yearly basis, all for new diesel emergency back-up internal combustion engines. These emergency engines are exempt from Rule 1401 but subject to Rule 212.

LEGISLATIVE MANDATES

The socioeconomic assessments at the SCAQMD have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed amendments include the SCAQMD Governing Board resolutions and various sections of the California Health & Safety Code (H&SC).

[1] There could be some increases for workers for some multipathway compounds (e.g., dioxins).

SCAQMD Governing Board Resolutions

On March 17, 1989 the SCAQMD Governing Board adopted a resolution that calls for an economic analysis of regulatory impacts that includes the following elements:

- Affected industries
- Range of control costs
- Cost effectiveness
- Public health benefits

On October 14, 1994, the Board passed a resolution which directed staff to address whether the rules or amendments brought to the Board for adoption are in the order of cost effectiveness as defined in the AQMP. The intent was to bring forth those rules that are cost effective first.

Health & Safety Code Requirements

The state legislature adopted legislation that reinforces and expands the Governing Board resolutions for socioeconomic assessments. H&SC Sections 40440.8(a) and (b), which became effective on January 1, 1991, require that a socioeconomic analysis be prepared for any proposed rule or rule amendment that "will significantly affect air quality or emissions limitations." While the present amendments do not have such effects, they will have costs, so staff determined to prepare this socioeconomic impact assessment. Specifically, the scope of the analysis should include:

- Type of affected industries
- Impact on employment and the economy of the district
- Range of probable costs, including those to industries
- Emission reduction potential
- Necessity of adopting, amending or repealing the rule in order to attain state and federal ambient air quality standards
- Availability and cost effectiveness of alternatives to the rule

Additionally, the SCAQMD is required to actively consider the socioeconomic impacts of regulations and make a good faith effort to minimize adverse socioeconomic impacts. H&SC Section 40728.5, which became effective on January 1, 1992, requires the SCAQMD to:

- Examine the type of industries affected, including small businesses; and
- Consider socioeconomic impacts in rule adoption

Finally, H&SC Section 40920.6, which became effective on January 1, 1996, requires that incremental cost effectiveness be performed for a proposed rule or amendment that imposes Best Available Retrofit Control Technology or “all feasible measures” requirements relating to ozone, carbon monoxide (CO), oxides of sulfur (SOx), oxides of nitrogen (NOx), and their precursors. This statute does not apply to the proposed rules; moreover, cost effectiveness in terms of dollars per ton is not meaningful for risk-based regulations, since many other factors besides the amount of pollution affect the risk such as the cancer potency and the location of receptors.

AFFECTED FACILITIES

The proposed amended rules will revise definitions and the SCAQMD risk assessment procedures to be consistent with the Revised OEHHA Guidelines. The SCAQMD staff is preparing Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0 and the 2015 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588). Both documents will incorporate the Revised OEHHA Guidelines and will be used to implement Rules 1401, 1401.1, 1402, and 212. As a result, the SCAQMD staff expects increases in the estimated cancer risk. The increases could potentially require additional controls that were previously not needed for certain source categories of equipment that are typically used by the potentially affected industries. They could also potentially require new or updated HRAs and increase the number of occasions that a facility is required to issue a public notice for an increase in toxic emissions. As emphasized earlier, however, the projected increase in the estimated cancer risk does not necessarily imply any increase in actual toxic emissions from any equipment source category. Instead, it is due to changes in risk assessment procedures that are made to be consistent with the Revised OEHHA Guidelines.

Below is a discussion of the potentially affected facilities, their industry types and sizes of the affected businesses. A detailed discussion of the assumptions and basis for the number of facilities that could potentially require additional pollution controls can be found in the Staff Report for the proposed amended rules. For the purpose of this analysis, the SCAQMD staff is assuming that the selected compliance path will be installation of pollution controls. There are other options available that many facilities may select including product replacement such as using materials with less or no toxic emissions, use of different fuels that are less toxic such as natural gas instead of diesel, locating the equipment at a distance to create a larger buffer between the equipment and the residential and sensitive receptors, and reduction of throughput. The availability of these alternative options depends on the specific situation at each facility.

As previously discussed the Revised OEHHA Guidelines primarily affect residential and sensitive receptors due to the increased susceptibility assumed for infants and children with very little change to worker receptors. This analysis assumes that there is a residential or sensitive receptor that would require risk reduction. This may not necessarily be the case particularly for facilities located at a substantial distance from residential or sensitive receptors or within an industrial location. Under those situations the facility would not be affected by implementation of the Revised OEHHA Guidelines.

PAR 1401 and 1401.1

As a result of using the Revised OEHHA Guidelines, PAR 1401 and 1401.1 could potentially require new or additional air pollution controls for new, relocated, or modified sources of TACs. It is challenging to predict the type, number, and size of new and modified sources that will be seeking permit applications. However, based on an evaluation of the SCAQMD permits that were issued over a five year period from October 2009 to October 2014, staff identified a total of seven equipment source categories that could potentially have an estimated cancer risk value above the existing thresholds when the Revised OEHHA Guidelines are used. However, PAR 1401 includes a provision to allow two of these source categories—spray booths and retail gasoline transfer and dispensing facilities—to continue to use the previous OEHHA risk guidelines to calculate the cancer risk until the SCAQMD staff returns to the Board with specific proposals for these industries.

For spray booths, SCAQMD staff's recommendation of continuing using the 2003 OEHHA Guidelines is because of the large number of permits issued (approximately 1,400 over the past five years), and importantly, also based on the consideration that this particular source category tends to be associated with smaller businesses such as wood coating operations and autobody facilities. The SCAQMD staff will begin rulemaking to identify alternative approaches by which industries using spray booths can reduce their toxic emissions and/or toxic exposure. For retail gasoline transfer and dispensing facilities, staff will need additional time to analyze new emissions data from CARB in order to better assess and understand the emission impacts from such facilities. PAR 1402 includes a commitment from the Executive Officer to return to the Governing Board as quickly as practicable with staff's analysis. Currently, all new gasoline stations are permitted with toxics best available controls and are required to comply with SCAQMD Rule 461 – Gasoline Transfer and Dispensing. This socioeconomic analysis does not include potential savings from this rule proposal. Analysis of socioeconomic impacts will be included for any subsequent proposed rule amendments for these equipment categories.

There remain five equipment source categories that could potentially need additional pollution controls with the Revised OEHHA Guidelines. Table 1 lists these equipment categories, and for each category, the typical pollution control device, type of industry that typically uses the equipment, and the number of expected permits per year within the SCAQMD jurisdiction. With the exceptions of motion picture film laboratories that are classified within the information sector (NAICS 51) and crematories within the services sector (NAICS 54-81), all other affected facilities are classified in the manufacturing sector (NAICS 31-33).

Table 1
New or Modified Permits that Potentially Could Require Additional Pollution Controls Using the Revised OEHHA Guidelines[1]

Equipment Category	Typical Control Device*	Industry that Typically Uses the Equipment (6-Digit NAICS Code)	Number of Expected Permits Per Year
Metal Plating Facilities – Plating Tanks	High Efficiency Particulate Arrestors (HEPA) Filter for Nickel Plating Tank	Electroplating, Plating, Polishing, Anodizing, and Coloring (332813)	1
Crematory – Furnace	Oxidation Catalysts for Polycyclic Aromatic Hydrocarbons	Cemeteries and Crematories (812220)	1
Plasma Arc and Laser Cutting	Baghouse for Metal Particulates	Machine Tool Manufacturing (333517)	24
Wet Gate Printing and Film Cleaning	Carbon Adsorber for Perchloroethylene	Other Motion Picture and Video Industries (512199)	1
Asphalt Blending and Concrete Batch	Diesel Particulate Filter on Diesel Internal Combustion Engine	Asphalt Paving Mixture and Block Manufacturing (324121)	1

[1] Based on SCAQMD analysis of permits issued between October 2009 and October 2014.
* In addition to installing the typical control device to reduce toxic emissions, an operator could alternatively choose other options, such as less toxic coatings and solvents, process throughput limits, and increasing the distance of the equipment from receptors.

PAR 1402

Rule 1402 establishes facility-wide risk requirements for existing facilities that emit TACs and implements the state AB2588 Air Toxics “Hot Spots” program. It requires facilities to submit an HRA for total facility emissions upon request. An HRA is a detailed comprehensive analysis to evaluate and predict the dispersion of hazardous substances in the environment, to determine the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure. If a facility has a facility-wide health risk greater than or equal to the action risk level of 25 in one million, the operator is required to implement risk reduction measures (specified in a risk reduction plan) to reduce the impact of total facility emissions below the action risk level as quickly as feasible, but by no later than three years. The AB2588 facilities are divided into four implementation groups. Each year, only one implementation group is subject to the “quadrennial” review where facilities are required to submit a detailed emissions inventory for 177 toxic air contaminants. (An annual toxics inventory for 23 toxic air contaminants is required during the three years between the quadrennial reviews.) The quadrennial review approach provides a more even workflow and reduces the impact on affected facilities to provide a detailed inventory. Implementation of the Revised OEHHA Guidelines will follow the existing quadrennial review process.

Based on an evaluation of the existing facilities that are in the AB2588 program, the SCAQMD staff estimates that 22 facilities could potentially have a cancer risk greater than or equal to the action risk level when using the Revised OEHHA Guidelines; therefore, these facilities would be required to implement risk reduction measures where they could potentially need to install additional air pollution controls. These facilities were identified based on health risks from previously approved HRAs and the increase in estimated health risk using the Revised OEHHA Guidelines. Facilities that were above 25 in one million were included regardless of recent changes to equipment or decreases in emission trends, and facilities that were just below 25 in one million were included if emissions have increased since the previous HRA. Due to the aforementioned quadrennial review process, it is expected that, each year between 2015 and 2018, one-fourth of the 22 AB2588 facilities (four to five) will install control equipment to reduce emissions below 25 in one million. Therefore from 2018 onward, all 22 facilities would have installed controls.

The type of control device(s) necessary for implementing risk reduction measures will vary by the pollutant(s) being emitted. A potentially affected facility may be required to reduce the emissions of multiple TACs, and therefore, it is possible that more than one control devices could potentially be needed at an individual facility. Table 2 lists the type of potentially affected facilities, and for each type, the typical control devise(s) needed for various pollutants, the facilities' industry classification, and the number of such facilities. Among the 22 AB2588 facilities that could potentially need additional controls due to the Revised OEHHA Guidelines, one is classified within the services sector (NAICS 54-81), three in the utilities sector (NAICS 22), and the rest are in the manufacturing sector (NAICS 31-33).

Moreover, the SCAQMD staff determined that 17 of the 22 facilities identified to be required to do risk reduction and install additional controls will also be required to submit updated HRAs. The other five of the 22 facilities have already been required to submit an updated HRA independent of the Revised OEHHA Guidelines. In addition, 42 existing AB2588 facilities will be required to update their HRAs and provide public notification, and 28 existing AB2588 facilities that had not previously submitted HRAs will be requested to do so. Among these 70 facilities that can potentially experience a cost impact due to PAR 1402 but are not expected to install additional controls, 40 are classified in the manufacturing sector (NAICS 31-33), 15 in the utilities sector (NAICS 22), and the rest in a variety of different sectors. For facilities that had an existing approved HRA, staff used the Revised OEHHA Guidelines and re-estimated the health risks based on their toxic inventory and equipment reported in the approved HRA. Those with an estimated health risk greater than 10 in one million will be expected to update their HRAs and have to conduct public notification. For facilities that had an estimated health risk just below 10 in one million, emission trends were examined and facilities with increasing emissions were included. For facilities that did not have an approved HRA, staff estimated health risks based on emission inventory reports using the AB2588 Draft Prioritization Procedures. The estimation utilized conservative assumptions regarding wind direction, receptor distance and other factors. Therefore, it is very likely that none of these facilities will have a calculated risk above 10 in one million after the initial HRA is submitted, thus eliminating the need to conduct public notification.

Overall, the estimation for the need of risk reduction, new or updated HRAs and public notification due to PAR 1402, is likely conservative (meaning that the actual number of facilities that would be affected is expected to be lower). This is because staff's estimations are based on previously submitted and approved HRAs and other information that may not reflect the most updated emission reductions measures that have been implemented at some facilities. It is possible that some facilities could have implemented emission reduction projects that have reduced air toxic emissions and health risks since the HRA was approved.

Table 2
Existing AB2588 Facilities that Potentially Could Need Additional Pollution Controls Using the Revised OEHHA Guidelines

Type of Facility	Typical Control Device(s)*	Industry Classification (6-Digit NAICS Code)	Estimated Number of Facilities**
Hospital	Oxidation Catalyst	General Medical and Surgical Hospitals (622110)	1
Waste Management	Carbon Adsorber Scrubber	Sewage Treatment Facilities (221320)	3
Aerospace	Carbon Adsorber HEPA Scrubber	Aircraft Manufacturing (336411)	6
Asphalt Manufacturer	Oxidation Catalyst	Asphalt Paving Mixture and Block Manufacturing (324121)	1
Metal Forging and Heat Treating	HEPA Scrubber	Machine Tool Manufacturing (333517)	1
Metal Melting	HEPA Scrubber	Industrial Process Furnace and Oven Manufacturing (333994)	3
Metal Plating and Finishing	HEPA Scrubber	Electroplating, Plating, Polishing, Anodizing, and Coloring (332813)	3
Petroleum Refining	Diesel Particulate Filters HEPA Oxidation Catalyst Scrubber Thermal Oxidizer	Petroleum Refineries (324110)	4

* The typical control device(s) needed depends on which toxic emissions are the main contributors to the estimated risk from a facility. It is possible that not all devices listed are needed at an individual facility. See Table 3-2 in the Staff Report for more details.

** It is expected that, each year between 2015 and 2018, one-fourth of the 22 AB2588 facilities (four to five) will install control equipment to reduce emissions below 25 in one million. Therefore from 2018 onward, all 22 facilities would have installed controls.

PAR 212

Rule 212 contains public notification requirements for new, modified, or relocated sources of air contaminants based on proximity to schools, increases to emissions above rule-specified daily maximums, and increases in TAC emissions resulting in cancer risks above rule-specified thresholds. Facilities that are projected to install control equipment because of changes to the revised OEHHA Guidelines will likely be below the rule-specified threshold for increased cancer risk after the control device is installed, so may not be required to do public notice unless they are located near schools.

However, with the revised OEHHA Guidelines, it is projected by staff that some diesel emergency back-up internal combustion engines could potentially have an estimated cancer risk greater than one in one million, the threshold above which the need for public notice is triggered for facilities with more than one permitted piece of equipment. While exempt from Rule 1401, these emergency engines are not exempt from Rule 212. Currently, more than 70 percent of them are already providing public notices because they are within 1,000 feet of a school. While some of these facilities may require additional language in the notice, compliance cost is not expected to become noticeably higher. However, staff projects that approximately 10 to 30 new emergency back-up engines annually will have a higher estimated cancer risk that is more than one in one million and are located greater than 1,000 feet away from a school. The new emergency engines that could potentially require the issuance of public notices are expected to be installed by a wide array of industries in the private sector and also by the public sector.

Small Businesses

The SCAQMD defines a "small business" in Rule 102 for purposes of fees as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. The SCAQMD also defines “small business” for the purpose of qualifying for access to services from the SCAQMD’s Small Business Assistance Office (SBAO) as a business with an annual receipt of $5 million or less, or with 100 or fewer employees. In addition to the SCAQMD's definition of a small business, the federal Clean Air Act Amendments (CAAA) of 1990 and the federal Small Business Administration (SBA) also provide definitions of a small business.

The CAAA classifies a business as a "small business stationary source" if it: (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either VOC or NOx, and (3) is a small business as defined by SBA. The SBA definitions of small businesses vary by six-digit North American Industrial Classification System (NAICS) codes. In general terms, a small businesses must have no more than 500 employees for most manufacturing and mining industries, and no more than $7 million in average annual receipts for most nonmanufacturing industries.[2]

[2] See the SBA website (http://www.sba.gov/community/blogs/community-blogs/small-business-matters/what-small-business-what-you-need-know-and-wh).The latest SBA definition of small businesses by industry can be found at http://www.sba.gov/content/table-small-business-size-standards.

All the definitions above apply at the firm level and do not apply to the public sector. PARs 1401, 1401.1, and 212 will be forward-looking and will not apply retroactively to previously issued permits; therefore, it is difficult to predict whether a facility that files a future permit application would be classified as a small business. However, as mentioned earlier, PAR 1401 includes a provision to allow spray booths to continue to use the previous OEHHA risk guidelines to calculate the cancer risk in consideration that this equipment category tends to be associated with smaller businesses such as wood coating operations and autobody facilities. Moreover, based on the distribution of existing permits that were issued between October 2009 and October 2014, it is estimated that, among the expected new and modified sources that could potentially need to install additional controls due to the Revised OEHHA Guidelines, there is a four percent probability that a new permit would belong to a small business as defined by Rule 102.

According to the Dun and Bradstreet database acquired in January 2015, five of the 22 existing AB2588 facilities that could potentially need additional controls due to the Revised OEHHA Guidelines would be classified as small businesses under the SBA definition. They are mostly metal plating and finishing or metal forging and heat treating facilities, with an estimated annual compliance cost of approximately $40,000 (see next section for detailed discussion of compliance costs). Based on SCAQMD permit data, however, none of the 22 facilities were reported as a small business as defined under Rule 102. Among the 70 facilities that would need to submit HRAs for the first time or to update their HRAs and provide public notification, 19 were identified as small businesses in the Dun and Bradstreet data, but none were reported as a small business as defined under Rule 102.

COMPLIANCE COSTS

The Revised OEHHA Guidelines will require some facilities to reduce the estimated health risk in order to obtain a permit, or may have to do public notice, for new, relocated, or modified sources of TACs. For the existing AB2588 facilities, there also may be additional control equipment required. While the analysis below focuses on the costs to install and operate add-on air pollution control equipment, other options are available to facilities to decrease risk. Where applicable, facilities may decide to use different materials that have less or no toxic emissions, use different fuels, move their equipment to create a larger distance between sensitive populations, or possibly limit throughput. Modifying operations to decrease or eliminate the emissions of air toxics is often a more cost-effective option. For example, the use of clean burning fuels, reformulated coatings, alternative solvents or trivalent chromium plating, where applicable, may reduce risks, allow increased throughput and lower operating costs. When determining which option to implement, facilities will ultimately choose the most cost-effective option for their particular situation. In many cases, the option chosen will not be to install add-on air pollution control equipment. However, to conservatively estimate the cost impacts of the proposed rule, the analysis will assume that impacted facilities will utilize add-on control equipment.

All the costs discussed in this section are expressed in 2015 dollars. For the purpose of projecting future compliance costs in the near future, it is assumed that these costs would remain the same within the analysis time frame and may increase only with inflation. The capital costs include installation and permitting fees. The analysis for risk determination would not increase SCAQMD staff time and result in additional costs as long as all currently requested information is provided with the application. Moreover, in order to compile the annual compliance costs for the additional controls assumed to be needed, it is assumed that facilities would finance the capital costs of control equipment at a real interest rate of four percent over its equipment life; as a sensitivity test, a real interest rate of one percent was also applied which is closer to the prevailing real interest rate.[3]

PAR 1401 and 1401.1

Rule 1401 requires the installation of Best Available Control Technology for Toxics (TBACT) if emissions would result in a risk above one in a million. A permit with TBACT can be issued if the resulting estimated risk is at or below ten in a million from the equipment. PAR 1401 costs will be incurred as potential applicants are required to install control equipment to permit equipment that would exceed a cancer risk of one in one million. As reported in Table 1 above, staff is anticipating approximately 28 permits annually to require installation of a control device to comply with PAR 1401 and assumes that no new or modified sources would be subject to PAR 1401.1 because they would choose to locate at a sufficient distant from schools to avoid the more stringent requirements. These facilities would still be subject to Rule 1401. While the types and sizes of control equipment will vary as determined by the applicant, staff is analyzing the annual costs based on previous control strategies utilized in similar situations.

- Metal Plating – It is expected that one metal plating shop will be required to install a high efficiency particulate arrestors (HEPA) to control nickel, hexavalent chromium or cadmium emissions. The capital cost of a HEPA system is $40,000 with a projected equipment life of ten years. On an annual basis, the electricity cost is $8,100 and the filter replacement cost is $500.
- Crematories – One facility per year will likely require an oxidation catalyst to control for polycyclic aromatic hydrocarbons. The oxidation catalyst has a capital cost of $140,000 with a projected equipment life of six years. However, there are no expected annual operating or maintenance costs.
- Plasma Arc and Laser Cutting – Approximately 24 plasma arc and laser cutting systems will require added air pollution control equipment annually to control hexavalent chromium emissions. An estimated 25% of the facilities have more than one cutting system and would only need one baghouse to control emissions from multiple cutting systems. The capital cost for each baghouse is $29,600 with an equipment life of ten years. For all 18 baghouses, the annual capital cost is $532,800.

[3] The SCAQMD has since 1987 adopted a real interest rate of four percent for the purpose of cost-effectiveness analysis. In comparison, the federal Office of Management and Budget annually updates the discount rates that are to be used for cost-effectiveness analysis of federal programs and policies. These discount rates are based on Treasury borrowing rates on marketable securities of comparable maturity to the period of analysis. For calendar year 2015, the real interest rate is 0.9 percent for a ten-year project. See https://www.federalregister.gov/articles/2015/01/29/2015-01616/discount-rates-for-cost-effectiveness-analysis-of-federal-programs (accessed March 28, 2015).

On an annual basis, the electricity costs for all 18 baghouses are $82,800 and the total bag replacement costs are $19,800.

- Wet Gate Printing and Film Cleaning – One facility is projected to require an additional carbon adsorption system to control perchloroethylene emissions from wet gate/film cleaning operations. The capital cost of the carbon adsorber is $176,000 with an equipment life of ten years. On an annual basis, the electricity costs are $13,100 while carbon replacement costs would be $5,700 annually.
- Asphalt and Concrete Batch Plants – One facility per year is estimated to require additional controls on diesel engines used to power an asphalt or concrete batch plant. The facility is projected to install a diesel particulate filter for $22,800 with a projected equipment life of eight years. Annual operating costs consist of maintenance and disposal of filter waste at a cost of $2,500.

Table 3 reports the projected compliance costs due to the additional controls needed for the expected 28 new or modified permits per year. Each year, the compliance costs due to PAR1401 are estimated to increase by an amount ranging from $239,000 to $255,000, depending on the real interest rate assumed (1%-4%). The machine tool manufacturing industry (NAICS 333517), where plasma arc and laser cutting facilities belongs, would bear the largest share of compliance costs (67%) due to a higher number of expected new or modified permits when compared to other potentially affected industries.

Table 3
Projected Compliance Costs by Industry Due to Additional Pollution Controls for New or Modified Permits (2015 Dollars)[1]

Industry Classification (6-Digit NAICS Code)	**Number of Expected Permits Per Year**	**Projected Increase in Compliance Costs Per Year of Installing Additional Controls***		
		4% Real Interest Rate	1% Real Interest Rate	Percent Distribution
Electroplating, Plating, Polishing, Anodizing, and Coloring (332813)	1	$14,000	$13,000	5%
Cemeteries and Crematories (812220)	1	$27,000	$24,000	10%
Machine Tool Manufacturing (333517)	24	$168,000	$159,000	67%
Other Motion Picture and Video Industries (512199)	1	$40,000	$37,000	16%
Asphalt Paving Mixture and Block Manufacturing (324121)	1	$6,000	$5,000	2%
All Industries	**28**	**$255,000**	**$239,000**	**100%**

[1] Based on SCAQMD analysis of permits issued between October 2009 and October 2014.
* Numbers may not sum up due to rounding.

PAR 1402

PAR 1402 requires facilities to implement risk reductions if the facility causes an estimated cancer risk of 25 in one million or greater, which is the existing "action level" threshold in the rule. Facilities typically will add on control devices to limit toxic emissions. SCAQMD staff evaluated the main toxic driver(s) for 22 facilities that could be potentially impacted by the revised OEHHA Guidelines. Under the District's AB 2588 program, facilities are divided into four implementation groups. Therefore, it is expected that, each year between 2015 and 2018, one-fourth of the 22 facilities (four to five) will install control equipment to reduce emissions below 25 in one million. The number of control devices by type assumed to be required over the quadrennial period is provided below along with the capital cost and operational and maintenance costs for each device. (Please refer to Table 2 regarding the type(s) of facilities potentially needing each type of control.)

- Carbon Adsorber – Four carbon adsorbers will be installed at a capital cost of $176,000 each. The projected equipment life is ten years. Annual electricity costs are $13,100 and carbon replacement costs would be $5,700 annually.
- Thermal Oxidizer – One thermal oxidizer will be installed at a capital cost of $1,100,000. The projected equipment life is 10 years. Annual electricity costs are $134,700 while annual gas costs would be $202,000 annually.
- HEPA Filters - Twelve HEPA filters will be installed at a capital cost of $80,000 each. The projected equipment life is 10 years. The annual electricity cost is $17,200 and the filter replacement cost is $1,000 annually.
- Diesel Particulate Filters - Two facilities are projected to install a diesel particulate filter for $120,000 each with a projected equipment life of eight years. Annual operating costs consist of maintenance and disposal of filter waste at a cost of $13,300.
- Oxidation Catalysts – Three facilities are expected to install oxidation catalysts. Each has a capital cost of $280,000 with a projected equipment life of six years. There are no expected annual operating or maintenance costs.
- Scrubbers – Fourteen scrubbers are expected to be installed. Each has a capital cost of $54,700 with a projected equipment life of ten years. Annual electricity cost for the scrubbers is estimated to be $5,500 each.

Table 4 shows the projected compliance costs due to the additional controls for the 22 existing AB2588 facilities that potentially could need additional pollution controls due to the Revised OEHHA Guidelines. From 2018 onward, after all the facilities are projected to have installed additional controls, the annual compliance costs due to PAR1402 are estimated to range from $1.3 million to $1.4 million, depending on the real interest rate assumed (1%-4%). Petroleum refineries (NAICS 324110) are expected to incur the largest share of compliance costs (47%), followed by the aircraft manufacturing industry (NAICS 336411, 21%). Other affected industries would account for three to nine percent of the projected annual compliance costs.

Table 4
Projected Compliance Costs by Industry for Existing AB2588 Facilities that Potentially Could Need Additional Pollution Controls (2015 Dollars)

Industry Classification (6-Digit NAICS Code)	Number of Existing Facilities	Projected Annual Compliance Costs 2018 Onwards***		
		4% Real Interest Rate	1% Real Interest Rate	Percent Distribution
General Medical and Surgical Hospitals (622110)	1	$53,000	$48,000	4%
Sewage Treatment Facilities (221320)	3	$93,000	$86,000	7%
Aircraft Manufacturing (336411)	6	$283,000	$264,000	21%
Asphalt Paving Mixture and Block Manufacturing (324121)	1	$53,000	$48,000	4%
Machine Tool Manufacturing (333517)	1	$40,000	$38,000	3%
Industrial Process Furnace and Oven Manufacturing (333994)	3	$93,000	$87,000	7%
Electroplating, Plating, Polishing, Anodizing, and Coloring (332813)	3	$121,000	$114,000	9%
Petroleum Refineries (324110)	4	$628,000	$597,000	47%
All Industries	**22**	**$1,365,000**	**$1,283,000**	**100.0%**

* Numbers may not sum up due to rounding.
** Each year between 2015 and 2018, it is expected that one-fourth of the 22 facilities (four to five) will install additional control equipment to come into compliance.

In addition, PAR 1402 is also expected to require some existing AB2588 facilities to update their HRAs or submit HRAs for the first time, which would incur one-time costs. The complexity of the HRA is determined by the number of different processes contributing toxic emissions. For this analysis, an HRA is considered “basic” if 1-2 processes contribute, “intermediate” if 3-5 processes contribute and “complex” if more than five processes contribute to toxic emissions. Furthermore, HRAs conducted for the first time at a facility are considered more costly (complex) than updated HRAs. Staff has estimated the cost of HRAs by complexity as listed in Table 5.

Table 5
Projected HRA and Public Notification Cost for Existing AB2588 Facilities (2015 Dollars)

Type and Complexity of HRA	Number of Existing Facilities	HRA Cost	Public Notification Cost
New HRA			
Basic	15	$15,000	n.a.
Intermediate	10	$45,000	n.a.
Complex	3	$75,000	n.a.
Updated HRA (Without Additional Controls)			
Basic	14	$10,000	$1,700
Intermediate	16	$20,000	$1,700
Complex	12	$30,000	$1,700
Updated HRA (With Additional Controls)			
Complex	17	$30,000	n.a.

Staff determined that 28 facilities that had not previously submitted HRAs would be requested to do so. Using the complexity criteria described above, 15 facilities would submit a basic new HRA, 10 would submit an intermediate new HRA and 3 would submit a complex new HRA. The total cost for new HRA submittal would be $900,000. Moreover, staff also determined that 42 facilities would be required to update their HRAs and provide public notification. Of the 42 facilities, 14 would submit a basic updated HRA, 16 would submit an intermediate updated HRA and 12 would submit a complex updated HRA. The total cost for updated HRA submittal would be $820,000. Public notification costs, which are one-time and include mailing and facility charges, are estimated to be $1,700 per public notification. For the 42 facilities, the total public notification cost under PAR 1402 would be $71,400. Lastly, 17 of the 22 facilities identified to be required to do risk reduction and install additional controls would also be required to submit updated HRAs. All 17 of the updated HRAs conducted for risk reduction purposes are considered to be complex. Thus the total cost for the risk reduction updated HRAs is estimated to be $510,000. For these 17 facilities, it is expected that regardless of the Revised OEHHA Guidance, the estimated health risk would be greater than 10 in a million, therefore public notification costs were not attributed to this proposed rulemaking.

Overall, the cost to do all HRAs, new and updated, is estimated to be $2.23 million. Adding in public notification cost, the total cost would arrive at $2.30 million. To put these costs into perspective with the annualized compliance cost of control installation, the annualized cost for HRA and public notification over 10 years would be $283,742 at 4% real interest rate and $242,987 at 1% real interest rate.

PAR 212

Rule 212 requires facilities to provide public notice for increases of toxic emissions if the cancer risk increase is greater than one in one million unless the total facility-wide cancer risk is less than ten in one million. Staff projects that approximately 10 to 30 new emergency diesel internal combustion engines annually would have an increase in estimated cancer risk by more than one in one million and be greater than 1,000 feet from a school. Providing public notice is estimated to cost $1,700. Each year, the compliance costs due to PAR 212 are estimated to be between $17,000 and $51,000, depending on the number of new notices required.

MACROECONOMIC IMPACTS ON REGIONAL ECONOMY

The REMI model (PI+ v1.6.7) was used to assess the total socioeconomic impacts of a policy change (i.e., the proposed amendments). The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino, and for each county, it is comprised of five interrelated blocks: (1) output and demand, (2) labor and capital, (3) population and labor force, (4) wages, prices and costs, and (5) market shares.[4]

The assessment herein is performed relative to a baseline ("business as usual") where the proposed amendments would not be implemented. The proposed amendments would create a policy scenario that can be summarized as such:

- Under PAR 1401, 28 new or modified permits each year would together incur compliance costs of $239,000 to $255,000 to install and operate additional control equipment and pay for permitting fees. The analysis is limited to the projected new, relocated, or modified sources permitted up to 2024 since it would be speculative to assume that the sources that will be permitted thereafter would continue requiring the same types of additional controls as currently assumed, due to changes and improvements in basic technology and control technology further into the future. It is assumed that no additional new or modified permits would be subject to PAR 1401.1 because they would choose to locate at a sufficient distant from schools to avoid the more stringent requirements.

- Under PAR 1402, 22 existing AB2588 facilities would incur an annual compliance costs totaling $1.3 million to $1.4 million to install and operate additional control equipment and pay for permitting fees. Consistent with the existing AB2588 program implementation schedule, the annual compliance costs are assumed to be evenly phased in over the period of 2015-2018 and remain the same until 2024, the last year of the analysis time frame. In addition to control equipment costs, 17 of the 22

[4] Within each county, producers are made up of 66 private non-farm industries, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across the four counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration. (For details, please refer to REMI online documentation at http://www.remi.com/products/pi.)

facilities would incur extra costs due to the need to update HRAs; moreover, 70 additional facilities under the AB2588 program would also incur costs related to new or updated HRAs and public notification.[5] For the purpose of this socioeconomic analysis, the total one-time HRA and notification costs of $2.30 million among the 87 facilities are assumed to be spread evenly over the period of 2015-2018. However, it is possible that the costs will be spread over a longer period of time, depending on operational feasibility, which would likely result in a smaller annual macroeconomic impact, especially in the first few years of rule implementation. Additionally, the cost estimates for impacts under PAR 1402 conservatively assume that facilities potentially impacted by the Revised OEHHA Guidelines have not undertaken any risk reduction measures since their last approved HRA or emission inventory. Based on a review of emission trends and pollution control equipment currently being installed, staff estimates that actual costs under PAR 1402 are likely to be 25% lower.

- Under PAR 212, 28 public notices at the cost of $1,700 each are assumed to be needed annually for the installation of new emergency diesel internal combustion engines that are over the Rule 212 public notification health risk thresholds.

Direct effects of the proposed amendments have to be estimated and used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the actors in the four-county economy on an annual basis and across a user-defined horizon (2015 to 2024). Direct effects of the proposed amendments include additional costs to the affected entities and additional sales, by local vendors, of equipment, devices, or services that would meet the proposed requirements.[6] Whereas all the compliance expenditures that are incurred by the affected facilities will increase their cost of doing business, the purchase of additional pollution control equipment, along with the spending on new and updated HRAs and public notification, will increase the sales of various sectors. Moreover, installation and maintenance of the control equipment would result in an increase in sales of many sectors as well. For example, the utility sector (NAICS 22) will benefit from the sales of additional electricity for the operation for most of the controls.

Table 5 lists the industry sectors modeled in REMI that would either incur or benefit from the compliance expenditures.[7] It should be noted that, although staff was able to make assumptions about the geographical location of directly affected facilities based on the review of SCAQMD permits, the same could not be achieved for the businesses from whom the affected facilities would purchase control equipment and services. As a result,

---

[5] Notice that one of the facilities that could need to update its HRA and issue public notification is a federal government entity. Therefore, its compliance cost is not modeled in the regional economic impact assessment while its spending is included when assuming that it would purchase the needed services from within the region. This is because the amount of increased expenses at the federal level is expected to have an infinitesimal economic impact on the region.

[6] To compile the REMI inputs, all amounts expressed in 2015 dollars are converted to 2009 dollars using CoreLogic's Marshall & Swift Equipment Indexes: 2015 dollar amount x (2009 annual index ÷ 2015Q2 index).

[7] It is worth mentioning that improved public health due to reduced air pollution emissions may also assert a positive effect on worker productivity and other economic factors; however, public health benefit assessment requires the modeling of air quality improvements. Therefore, it is conducted for Air Quality Management Plans and not for individual rules or rule amendments.

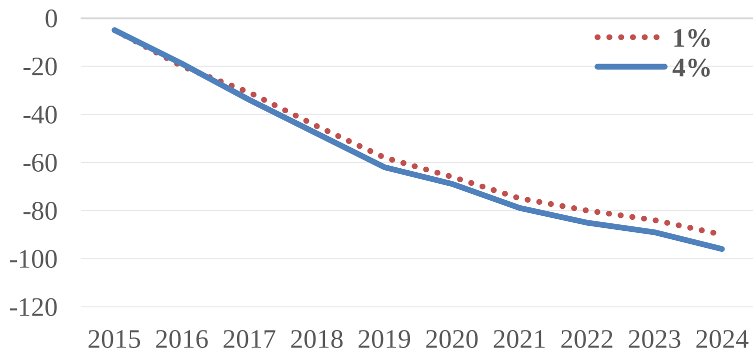
staff adopted the ad-hoc assumption that the affected facilities would purchase controls and other services from providers within the same county.

Table 6
Industries Incurring *vs.* Benefitting from Compliance Costs/Spending

Source of Compliance Costs	REMI Industries Incurring Compliance Costs (NAICS)	REMI Industries Benefitting from Compliance Spending (NAICS)
HEPA Filters	Petroleum and coal products manufacturing (324); Fabricated metal product manufacturing (332); Machinery manufacturing (333); Other transportation equipment manufacturing (3364-3369)	*Capital:* Machinery manufacturing (333)
		O&M: Utilities (22); Textile mills & textile product mills (313-314)
Oxidation Catalysts	Petroleum and coal products manufacturing (324); Hospitals (622); Personal and laundry services (812)	*Capital:* Machinery manufacturing (333)
Baghouses	Machinery manufacturing (333)	*Capital:* Machinery manufacturing (333)
		O&M: Utilities (22); Textile mills & textile product mills (313-314)
Carbon Adsorbers	Utilities (22); Other transportation equipment manufacturing (3364-3369); Motion picture and sound recording industries (512)	*Capital:* Machinery manufacturing (333)
		O&M: Utilities (22); Chemical manufacturing (325)
Diesel Particulate Filters	Petroleum and coal products manufacturing (324)	*Capital:* Machinery manufacturing (333)
		O&M: Waste management and remediation services (562)
Scrubbers	Utilities (22); Petroleum and coal products manufacturing (324); Fabricated metal product manufacturing (332); Machinery manufacturing (333); Other transportation equipment manufacturing (3364-3369)	*Capital:* Machinery manufacturing (333)
		O&M: Utilities (22)
Thermal Oxidizers	Petroleum and coal products manufacturing (324)	*Capital:* Machinery manufacturing (333)
		O&M: Utilities (22)
New and Updated HRAs	Various	Professional, scientific, and technical services (54)
Public Notices	Various	Administrative and support services (561)

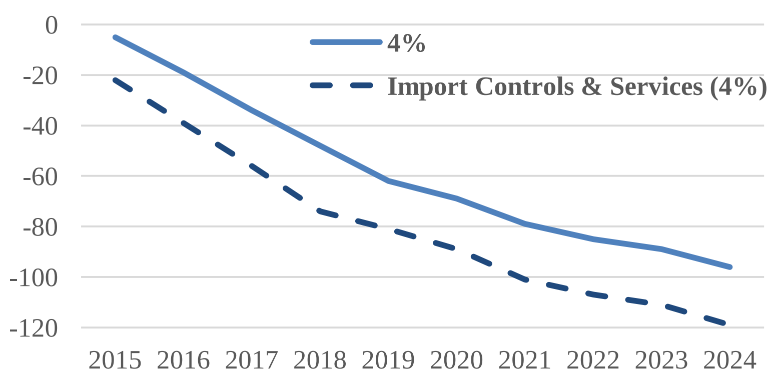
As shown in Figure 1, the proposed amendments are expected to result in approximately 10 to 100 annual jobs forgone between 2015 and 2024 when a 4-percent real interest rate is assumed (approximately 10 to 90 annual jobs with a 1-percent real interest rate). The projected job impacts represent less than 0.001 percent of the total employment in the four-county region. Almost all major sectors of the regional economy would be impacted by the projected reduction in employment. The manufacturing sector (NAICS 31-33), which is projected to bear the majority of estimated total compliance costs, would not lose more jobs than the other industry sectors. This is because other businesses in the manufacturing sector, specifically in the machinery manufacturing industry, are expected to benefit from the increased sale of various types of control equipment, thus offsetting the direct effect of compliance costs incurred by other manufacturing facilities.

Figure 1
Projected Regional Job Impact, 2015-2024



To sensitivity-test the assumption that the affected facilities would purchase controls and other services from providers within the same county, Figure 2 presented an alternative scenario where it is assumed that all equipment and services are imported from outside the region. At a 4-percent interest rate, the job impact expectedly became more negative. The number of jobs foregone increased by about 20 percent, to approximately 20 to 120 annual jobs foregone between 2015 and 2024.

Figure 2
Projected Regional Job Impact with
Imported Equipment and Services, 2015-2024



EMISSION REDUCTION POTENTIAL

PAR 1401, 1401.1 and 1402 could potentially require the installation of additional air pollution control equipment as a result of implementing the Revised OEHHA Guidelines to reduce toxic emissions. These reductions are to ensure facilities can meet existing health risk thresholds specified in Rules 1401, 1401.1, and 1402.

NECESSITY OF RULE ADOPTION

Please refer to the Staff Report.

RULE ADOPTION RELATIVE TO COST-EFFECTIVENESS

Please refer to the Staff Report.

INCREMENTAL COST-EFFECTIVENESS

Please refer to the Staff Report.

REFERENCES

Dun & Bradstreet Enterprise Database. 2015.

Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Area (70 sector model). Version 1.6.7.

South Coast Air Quality Management District. Preliminary Draft Staff Report Proposed Amended Rule 212 – Standards for Approving Permits and Issuing Public Notice, 1401 – New Source Review of Toxic Air Contaminants, 1401.1 – Requirements for New and Relocated Facilities Near Schools, and 1402 – Control of Toxic Air Contaminants from Existing Sources. Diamond Bar, CA. March 2015.

ATTACHMENT J

South Coast Air Quality Management District

DRAFT
RISK ASSESSMENT PROCEDURES
for Rules 1401, 1401.1 and 212

Version 8.0

June 5, 2015

TABLE OF CONTENTS

INTRODUCTION	**1**
OVERVIEW	**5**
PRELIMINARY TASKS	**5**
TIER 1: SCREENING EMISSION LEVELS	**7**
MULTIPLE POLLUTANT SCREENING LEVEL PROCEDURE	**7**
TIER 2: SCREENING RISK ASSESSMENT	**9**
INSTRUCTIONS FOR CALCULATING MICR	**10**
INSTRUCTIONS FOR CALCULATING CANCER BURDEN	**21**
INSTRUCTIONS FOR CALCULATING HIA AND HIC	**22**
ACUTE HAZARD INDICES FOR COMPOUNDS HAVING RELS AVERAGED OVER 4, 6, OR 7 HOURS	**23**
PROCEDURE FOR ALTERNATE HAZARD INDEX EXEMPTION	**24**
TIER 3: SCREENING DISPERSION MODELING	**25**
TIER 4: DETAILED RISK ASSESSMENT	**26**
EXAMPLES	
EXAMPLE 1: MICR, CANCER BURDEN, AND HIC CALCULATION	**27**
EXAMPLE 2: MICR, CANCER BURDEN, HIC, HI8, AND HIA CALCULATION	**33**
EXAMPLE 3: CONTEMPORANEOUS RISK REDUCTION	**45**
EXAMPLE 4: FUNCTIONALLY IDENTICAL EQUIPMENT REPLACEMENT	**47**
BEST AVAILABLE CONTROL TECHNOLOGY FOR TOXICS	**48**

APPENDICES

I CALCULATION WORKSHEETS

MAXIMUM INDIVIDUAL CANCER RISK (MICR) CALCULATION WORKSHEET

ACUTE HAZARD INDEX (HIA) CALCULATION WORKSHEET

CHRONIC HAZARD INDEX (HIC) CALCULATION WORKSHEET

II DERIVATION OF TIER 2 MULTI-PATHWAY ADJUSTMENT FACTORS (MP) AND METEOROLOGICAL CORRECTION FACTORS (MET)

III PROCEDURES FOR ADDRESSING NON-DETECTED COMPOUNDS AND BLANKS IN RISK ASSESSMENT

IV FLOW CHARTS AND DIAGRAMS

FIGURE 1: PRELIMINARY TASKS

FIGURE 2: TIER 1 - SCREENING LEVELS

FIGURE 3A: TIER 2 - SCREENING LEVELS

FIGURE 3B: TIER 2 - MAXIMUM INDIVIDUAL CANCER RISK CALCULATION

FIGURE 3C: TIER 2 - MAXIMUM INDIVIDUAL CANCER RISK EQUATION

FIGURE 3D: TIER 2 - DISPERSION FACTOR

FIGURE 3E: TIER 2 - CANCER POTENCY FACTOR

FIGURE 3F: TIER 2 - MULTI-PATHWAY ADJUSTMENT FACTOR

FIGURE 3G: TIER 2 - EXPOSURE VALUE FACTOR

FIGURE 3H: TIER 2 - DAILY BREATHING RATE

FIGURE 3I: TIER 2 - ANNUAL CONCENTRATION ADJUSTMENT FACTOR

FIGURE 4: CANCER BURDEN

FIGURE 5: CHRONIC AND ACUTE HAZARD INDEX

V RULE 1401 EXEMPTION PROVISIONS

VI TIER 2 SCREENING TABLES FOR NON-COMBUSTION SOURCES FOR USE IN RULE 1401

VII TIER 2 SCREENING TABLES FOR COMBUSTION SOURCES FOR

USE IN RULE 1401

VIII TIER 2 SCREENING TABLES FOR CREMATORIUMS FOR USE IN RULE 1401

IX TIER 2 SCREENING TABLES FOR SHORT- TERM PROJECTS FOR USE IN RULE 1401

X TIER 2 SCREENING TABLES FOR RETAIL GAOSLINE DISPENSING FACILITIES FOR USE IN RULE 1401

XI TIER 2 SCREENING TABLES FOR SPRAY BOOTHS FOR USE IN RULE 1401

ATTACHMENTS.
PERMIT APPLICATION PACKAGES INCLUDING TABLES

A: PERMIT APPLICATION PACKAGE "M"
effective July 5, 2015

INTRODUCTION

Risk assessment procedures, including procedures for a simple risk screening, were originally developed by South Coast Air Quality Management District (SCAQMD) staff for the adoption of Rule 1401 - New Source Review of Toxic Air Contaminants, in June 1990. Since that time, this document has been revised several times to reflect updated risk assessment methodologies. This current version 8.0 has been updated to provide District specific guidance consistent with the OEHHA's 2015 revision to its Health Risk Assessment Guidance.

The purpose of this document is to:

- assist applicants and engineers to evaluate Rule 1401 and 1401.1 compliance;
- provide explanations and sample risk calculations; and
- provide industry worksheets.

This document describes the procedures for preparing risk assessments under Rule 1401 and Rule 212 – Standards for Approving Permits and Issuing Public Notice. It also applies to Rule 1401.1 for sources located near schools. It is intended to be a "living" document. That is, as new toxic air contaminants (TACs) are added, risk values changed, or procedures revised, the document will be updated. This version of "Risk Assessment Procedures for Rules 1401, 1401.1 and 212" is based on "The Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments" ("Guidance Manual") prepared by the state Office of Environmental Health Hazard Assessment (OEHHA) and approved on March 6, 2015. The Guidance Manual may be found at: http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf. The 2015 Guidance Manual supersedes OEHHA'S 2003 version of its Guidance Manual. Past procedures will be archived and TAC toxicity criteria have been separated by the time period of significant Rule 1401 changes (see attachments). The revised OEHHA Guidance Manual incorporates age sensitivity factors which will increase cancer risk estimates to residential and sensitive receptors by approximately 3 times, and more than 3 times in some cases depending on whether the toxic air contaminant has multiple pathways of exposure in addition to inhalation. Under the revised OEHHA Guidance Manual, even though the toxic emissions from a facility have not increased, the estimated cancer risk to a residential receptor will increase. Cancer risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged.

Background

There are four steps involved in the risk assessment process; 1) hazard identification, 2) exposure assessment, 3) dose-response assessment, and 4) risk characterization. Each step is briefly discussed below.

Hazard Identification

For air toxics sources, hazard identification involves determining the type of adverse health effect associated with exposure of the pollutant of concern emitted by a facility, including whether a pollutant is considered human carcinogen or a potential human carcinogen.

Exposure Assessment

The purpose of exposure assessment is to estimate the extent of public exposure to emitted substances for potential cancer, noncancer health hazards for chronic and acute, and repeated 8-hour exposures. This involves estimation of long-term (annual), short-term (1-hour maximum), and 8-hour average exposure levels.

Dose-Response Assessment

Dose-response assessment is the process of characterizing the relationship between exposure to a chemical by its modeled concentration. Dose can be calculated as follows:

Dose = Concentration x Exposure

Risk Characterization

This is the final step of the risk assessment in which the information from exposure assessment and dose-response assessment are combined to assess total risk to the surrounding community.

SCAQMD Rule 1401 History

Rule 1401, adopted June 1, 1990 and amended December 7, 1990, specified limits for maximum individual cancer risk (MICR) and excess cancer cases for new, relocated, or modified equipment which emits carcinogenic air contaminants. The rule was amended July 10, 1998 to include non-carcinogenic compounds. The rule was amended on March 17, 2000 to remove the requirement to assess cumulative risk from emissions from units permitted after 1990 located within 100 meters of the new equipment under evaluation for permit. And, the rule has been amended several times to change the list of regulated compounds (both additions and deletions) and their corresponding risk values (cancer potency factors and reference exposure levels).

Requirements

This document describes the procedures for determining cancer and non-cancer health effects for equipment subject to Rules 1401, 1401.1, and 212.

In general, these rules apply only if there is an increase in TAC emissions from new, relocated, or modified equipment. Details regarding applicability of these rules to facilities or equipment can be found within the rules themselves at: http://www.aqmd.gov/home/regulations/rules/proposed-rules#1401

Under Rule 1401, the following requirements must be met before a permit is granted for affected equipment.

- The cumulative increase from all TACs emitted from a single piece of equipment in maximum individual cancer risk (MICR) shall not exceed:

  - one in one million (1×10^{-6}) if Best Available Control Technology for Toxics (T-BACT) is not used; or,
  - ten in one million (10×10^{-6}) if T-BACT is used;

- The cumulative cancer burden from all TACs emitted from a single piece of equipment (increase in cancer cases in the population) shall not exceed 0.5; and,

- Neither the chronic hazard index (HIC), the 8-hour chronic hazard index (HIC8), nor the total acute hazard index (HIA) from all TACs emitted from a single piece of equipment shall exceed 1.0 for any target organ system, or an alternate hazard index level deemed to be safe.

Rule 1401.1 is designed to be more health protective for school children than Rule 1401 by establishing more stringent risk requirements related to facility-wide cancer risk and non-cancer acute and chronic HI for new and relocated facilities emitting toxic air contaminants near schools, thereby reducing the exposure of toxic emissions to school children. For new facilities, the rule requires the facility-wide cancer risk to be less than one in one million at any school or school under construction within 500 feet of the facility. If there are no schools within 500 feet, the same risk levels must be met at any school or school under construction within 500 to 1,000 feet unless there is a residential or sensitive receptor within 150 feet of the facility. For relocating facilities, the facility must demonstrate, for each school or school under construction within 500 feet of the facility, that either: 1) the risk at the school from the facility in its new location is no greater than the risk at that same school when the facility was at its previous location, or 2) the facility-wide cancer risk at the school does not exceed one in one million. Unlike other SCAQMD risk-based rules, the required risk thresholds of Rule 1401.1 do not change based on whether or not the source is equipped with T-BACT.

Rule 212 also applies to Rule 1401 exempt sources. Rule 212 (c)(3) requires public notification if the MICR, based on Rule 1401 risk assessment procedures, exceeds one in one million (1×10^{-6}), due to a project's proposed construction, modification, or relocation for facilities with more than one permitted equipment unless the applicant can show the total facility-wide MICR is below ten in a million (10×10^{-6}). For facilities with a single permitted piece of equipment, the MICR level must not exceed ten in a million (10×10^{-6}). The circulation and distribution of the notifications must meet the criteria in Rule 212.

Revisions

The major revisions to this document include incorporation of updated risk assessment methodologies pursuant to OEHHA's 2015 update of its Guidance Manual. These include:

- Increased risk to children from cancer causing substances;
- Higher breathing rates for children;
- Lower exposure durations for residents and workers;
- Different multipathway calculation methodologies and factor;
- Incorporation of AERMOD air dispersion model into HARP2 in place of the previously used ISCST3 model in HARP;
- Inclusion of the 8-hr chronic non-cancer risk estimate;

- Calculation of risk in individual age bins (e.g., third trimester, 0-2 years, etc.) rather than a single lifetime calculation;
- Removal of meteorological correction factors in favor of more precise dispersion factors provided for each meteorological station; and
- Inclusion of a short-term (i.e., 9-years) exposure risk calculation for permits that include a 'sunset' condition.

These items are described in greater detail in the following chapters. The first three come from the recent revisions to OEHHA's Guidance Manual. The last one is unique to the SCAQMD and these procedures.

OVERVIEW

This document provides several tiers for preparing a risk assessment, from a quick look-up table to a detailed risk assessment involving air quality dispersion modeling analysis. Permit applicants may use any of these tiers to demonstrate compliance with the risk limits of Rule 1401. The applicant should include a copy of the risk assessment with the permit application.

The tiers are designed to be used in order of increasing complexity with each higher tier providing a more refined estimate of risk than the lower tier. If compliance cannot be demonstrated using one tier, the permit applicant may proceed to the next tier. A permit applicant who can show compliance by using a lower tier does not need to perform an analysis for the higher tiers. In general, for most permits a detailed analysis is not required. The tiers are:

- Tier 1: Screening Emission Levels
- Tier 2: Screening Risk Assessment
- Tier 3: Screening Dispersion Modeling
- Tier 4: Detailed Risk Assessment

Please note that the OEHHA Guidance Manual "Tier" approach differs from these SCAQMD Risk Procedures "Tier" compliance. The OEHHA Tiers refer to the incorporation of stochastic modeling for the facility and population specific exposure parameters. In contrast, the SCAQMD Tiers refer to increasing complexity for deriving pollutant concentrations based on facility emissions. Regulatory compliance may be demonstrated with any SCAQMD Tier.

In addition, this document briefly discusses the Best Available Control Technology for Toxics (T-BACT) identification process for Rule 1401.

PRELIMINARY TASKS

Before conducting any of these risk assessment tiers, three preliminary tasks must be performed:

1. **Determine if the permitting action or equipment is exempt from the provisions of Rule 1401.** Exemptions are granted for:

   * permit renewal or change of ownership;
   * modifications with no increase in risk;
   * functionally identical equipment replacement;
   * equipment previously exempt under Rule 219 and filing for a permit to operate within one year of removing the Rule 219 exemption;
   * modifications to terminate research projects;
   * emergency internal combustion engines (ICEs) exempt under Rule 1304.

   An additional exemption is granted for demonstrations of contemporaneous emission reductions such that no receptor experiences a total increase in MICR of greater than one in one million and the contemporaneous reduction occurs within 100 meters of the equipment.

If the equipment falls under one of these exemptions, no further risk assessment is required.

2. **Identify the toxic air contaminants (TAC) emitted by the permit unit**. The risk assessment must include those TACs emitted by the permit unit which were listed in the rule when the permit application was deemed complete by SCAQMD staff. Sets of tables corresponding to each rule revision are included at the end of this document as attachments (i.e. Attachment L, M, etc.). Determine the date on which the application was deemed complete and refer to the appropriate attachments. The first table in the attachment lists the TACs subject to Rules 1401, 1401.1 and Rule 212.

   For guidance, California Air Resources Board (CARB) has prepared a table listing devices and processes as they relate to the types of emissions and the specific contaminants emitted. This table is available on the CARB webpage at: www.arb.ca.gov/ab2588/ab2588.htm. Click on "Inventory Guidelines", and then on "Appendix C - Facility Guideline Index." Please note that this table is not an exhaustive list. Facilities are, therefore, advised to use this table for guidance only.

   Default toxic emission factors for TACs associated with combustion equipment have been developed for use in the AB2588 Program and are available on the SCAQMD webpage at: http://www.aqmd.gov/docs/default-source/permitting/toxics-emission-factors-from-combustion-process-.pdf. If better source specific data such as SCAQMD approved source tests, manufacturer's data, or fuel analysis is available, it should be used rather than the default emission factors.

   If no TACs listed in the applicable version of Rule 1401 are emitted by the equipment, no further risk assessment is required.

3. **Estimate the quantity of emissions from the permit unit.** The appropriate emission estimation technique depends on the type of source. Techniques include emission testing, a mass balance or other engineering calculation, or emission factors for specific types of processes. The emissions used for the risk calculation should be post-control emissions (that is, reductions in emissions due to enforceable controls and permit conditions should be taken into account). SCAQMD permitting staff should be consulted regarding approved techniques for identifying contaminants and estimating emissions for specific sources.

   The SCAQMD also has a broader mandate to ensure that permits are not granted to facilities which may endanger public health (California Health and Safety Code Section 41700). In addition, under Rule 212, the applicant may be required to evaluate other compounds that are determined to be potentially toxic. Therefore, an applicant may be required to evaluate risks from compounds not listed in the attachment as part of the permitting process if they are a concern for a specific source. These may include substances with irritant effects or other adverse health effects.

Tier 1: Screening Emission Levels

OVERVIEW OF TIER 1

Tier 1 involves a simple look-up table (Table 1.1) in which the equipment's emissions are compared to Screening Levels. The Screening Levels are pollutant emission thresholds which are not expected to produce a MICR greater than one in one million nor a hazard index greater than one.

Tier 1 can be used by applicants to determine whether or not detailed risk analysis will be required when filing for a permit. It can also be used by applicants and SCAQMD staff to determine whether a permit is required based on paragraph (s)(2) in Rule 219 – Equipment not Requiring a Written Permit Pursuant to Regulation II.

Tier 1 may be used only for a single emission source and a single toxic air contaminant. However, it can be used for multiple pollutants if the Multiple Pollutant Screening Level Procedure (described below) is followed.

INSTRUCTIONS FOR TIER 1

The Tier 1 analysis is performed as follows:

1. Determine the maximum annual emissions (for cancer and non-cancer 8-hour and chronic TACs) and determine the maximum hourly emissions (for non-cancer acute TACs).
2. Compare the emissions to the Screening Levels for that contaminant in Table 1.1. Columns are labeled with the distance to the nearest receptor.
3. If the maximum annual emissions or the maximum hourly emissions do not exceed the Screening Levels, the equipment will comply with Rule 1401 and does not require notice under Rule 212 for toxics.
4. If the maximum annual emissions or the maximum hourly emissions exceed the Screening Levels, proceed to Tier 2.

The Screening Levels in Table 1.1 were determined by back calculation, using the highest dispersion factors (χ/Q) established in Tables 2.1 through 5.6 that would not exceed a cancer risk of one in one million or an 8-hour or chronic or acute hazard index of one.

MULTIPLE POLLUTANT SCREENING LEVEL PROCEDURE

1. Calculate the Pollutant Screening Index for each TAC (PSI_{TAC}). For each carcinogenic and/or 8-hour or chronic compound, divide the maximum annual emissions (in pounds per year) of each TAC (Q_{lbpy}) by the Annual Pollutant Screening Level ($PSL_{TAC,\ Annual}$) in pounds per year, as contained in Table 1.1. For each acute compound, divide the maximum hourly emission (Q_{lbph}) of each TAC by the Hourly Pollutant Screening Level ($PSL_{TAC,\ Hourly}$) as contained in Table 1.1.

$PSI_{TAC,\ Cancer,\ 8\text{-}hr,\ or\ Chronic} = Q_{lbpy,TAC} / PSL_{TAC,\ Annual}$

$PSI_{TAC,\ Acute} = Q_{lbph,TAC} / PSL_{TAC,\ Hourly}$

2. Calculate the Application Screening Index (ASI). Sum up the individual Pollutant Screening Indices for all chronic, 8-hr and carcinogenic pollutants (PSI_P) and, separately, for all acute TACs.

   $ASI_{cancer,8\text{-}hr,chronic} = PSI_{TAC1,cancer,8\text{-}hr,chronic} + PSI_{TAC2,cancer,8\text{-}hr,chronic} + PSI_{TAC3,cancer,8\text{-}hr,chronic} + \ldots$

   $ASI_{acute} = PSI_{TAC1,acute} + PSI_{TAC2,acute} + PSI_{TAC3,acute} + \ldots$

3. Neither the $ASI_{cancer,8\text{-}hr,chronic}$, nor the ASI_{acute} can exceed one.

Refer to Example 2 (starting on page 33) for multiple pollutant screening.

If step 3 cannot be met, proceed to Tier 2.

Tier 2: Screening Risk Assessment

OVERVIEW OF TIER 2

Tier 2 is a screening risk assessment, which includes procedures for determining the level of risk from a source for Cancer Risk, Cancer Burden, Acute, 8-hour and Chronic Hazard Indices. If the estimated risk from Tier 2 screening is below Rule 1401 limits, then a more detailed evaluation is not necessary. Examples of calculations are provided at the end of the description of Tier 4 risk assessment. (See page 26)

If the screening risk assessment results in a risk estimate that exceeds the risk limits or the permit applicant feels that a more detailed evaluation would result in a lower risk estimate, the applicant has the option of conducting a more detailed analysis using Tier 3 or 4.

To perform a Tier 2 screening risk assessment, the following information is needed:

- **Maximum annual emissions** of each carcinogen and non-cancer 8-hour and chronic TAC, and the **maximum hourly emissions** of each non-cancer acute TAC;
- The **distance** from the permit unit to the nearest off-site residential and worker receptor(s);
- Certain source characteristics, such as **stack height** and/or **building dimensions**;
- **Operating schedule**: whether the permit unit will operate more or less than 12 hr/day; and
- **Geographic location** of the permit unit (e.g., city).

In order to perform a Tier 2 screening risk assessment, it is necessary to identify the nearest receptor location. For the purpose of calculating the MICR, 8-hour and chronic HI, a receptor is any location outside the boundaries of the facility at which a person could experience repeated, continuous exposure. For the purpose of calculating the acute HI, a receptor is any location outside the boundaries of the facility at which a person could experience exposure over a short timeframe. Receptor locations include residential, commercial and industrial areas, and other locations where sensitive receptors may be located. Residential receptor locations include current residential land uses and areas which may be developed for residential uses in the future, given existing or planned zoning. Commercial/industrial receptor locations include areas zoned for manufacturing, light or heavy industry, office or retail activity. Sensitive receptor locations include schools, hospitals, convalescent homes, day-care centers, and other locations where children, chronically ill individuals or other sensitive persons could be exposed to TACs.

When identifying receptor locations in order to calculate cancer risk, 8-hour or chronic hazard index, the potential for chronic (long-term) exposure should be considered. Land uses at which it is not possible for individuals to be exposed on a long-term basis such as roadways or highways should not be used. When identifying receptor locations to calculate acute hazard index, all off-site locations where there is the potential for acute exposure should be considered (i.e. fenceline receptor). Refer to Rule 1401 – New Source Review of Toxic Air Contaminants for more information regarding receptor locations to be considered.

For assessment of residential cancer risk, the risk is calculated in individual age bins (e.g., third trimester, 0-2 years, etc.) rather than a single lifetime calculation, whereas, for off-site worker, the default assumption is that working age begins at 16 years.

INSTRUCTIONS FOR CALCULATING MAXIMUM INDIVIDUAL CANCER RISK (MICR)

The MICR Calculation Worksheet in Appendix I can be used to help with the calculation. This worksheet can be included in the permit application as documentation of the MICR calculation.

MICR is calculated as follows:

$$\textbf{MICR} = \textbf{Cancer Potency (CP)} \times \textbf{Dose (D)} \times 10^{-6}$$

Where:

$$\textbf{Dose} = \textbf{Concentration} \times \textbf{Exposure}$$

$$\textbf{Concentration} = \textbf{GLC} = (Q_{tpy} \times \chi/Q) \times \textbf{MWAF}$$

$$\textbf{Exposure}_{AgeBin} = DBR_{AgeBin} \times ED_{AgeBin} \times ASF_{AgeBin} \times FAH_{AgeBin}$$

$$CEF_R = (\textbf{Exposure}_{0.25\text{-}0} + \textbf{Exposure}_{0\text{-}2} + \textbf{Exposure}_{2\text{-}16} + \textbf{Exposure}_{16\text{-}30}) \times EF_R / AT$$

$$\textbf{Exposure}_R = CEF_R \times MP_R$$

$$CEF_W = DBR_W \times ED_W \times EF_W / AT$$

$$\textbf{Exposure}_W = CEF_W \times MP_W \times WAF$$

You may also use the following equation using **default combined exposure factor:**

$$MICR_R = CP \times Q_{tpy} \times \chi/Q \times CEF_R \times MP_R \times 10^{-6} \times MWAF$$

$$MICR_W = CP \times Q_{tpy} \times \chi/Q \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF$$

For Tier 2 screening risk assessment procedures for short-term projects, refer to Appendix IX.

Term	Description	Where to Find
GLC	Ground Level Concentration = Q_{tpy} x χ/Q	
Q_{tpy}	Maximum emission rate (tons/yr)	Emission estimate specific to permit unit
χ/Q	Concentration at a receptor distance / Emission Rate [(μg/m^3)/(tons/yr)]	Tables 2.1 thru 5.42 – Annual Tables 6.1 & 7.1 – Hourly
MWAF	Molecular Weight Adjustment Factor	Table 8.1
CP	Cancer Potency (mg/kg-day)$^{-1}$	Table 8.1
REL	Reference Exposure Level (μg/m^3)	Table 8.1
MP	Multipathway Factor (if applicable)	Table 8.1
CEF	Combined Exposure Factor	Tables 9.1 and 9.2
DBR	Daily breathing rate (L/kg body weight-day)	Tables 9.1 and 9.2
ASF	Age Specific factor (unitless)	Tables 9.1 and 9.2
ED_R	Exposure Duration (30 years) – Residential	Tables 9.1 and 9.2
ED_W	Exposure Duration (25 years) – Worker	Tables 9.1 and 9.2
FAH	Fraction of time spent at home (unitless)	Table 9.1
EF_R	Exposure Frequency, Residential = 0.96 (350 days / 365 days), unitless	Tables 9.1 and 9.2
EF_W	Exposure Frequency, Worker = 0.68 (250 days / 365 days), unitless	Tables 9.1 and 9.2
AT	Averaging Time (lifetime exposure = 70 years)	
WAF	Worker Adjustment Factor	Tables 10.1 and 10.2
10^{-6}	Micrograms to milligrams conversion, liters to cubic meters conversion	not applicable
	Target Organs	Tables 11.1 thru 11.3

Step 1: Estimate Emission Rate (Q_{tpy})

The maximum annual emissions of the TAC in tons/year (Q_{tpy}) must be estimated. The emission rate must be expressed in tons/year because the dispersion factors (**χ/Q**) are expressed in tons/year.

Step 2: Determine Release Type

Determine whether the permit unit is best characterized as a point source or a volume source:

- A **point source** is one that releases its emissions through a stack (designed with acceptable stack height). If the point source has a raincap or a horizontal release, a Tier 3 or 4 assessment is required.
- A **volume source** includes emissions that are unrestricted by any physical means (e.g. pipes or vents and/or vacuum or fan), including releases inside of a building or as fugitive emissions.

For permit units that have both point and volume releases, use the table that will result in the highest χ/Q value, or apportion the emissions between the point and volume sources.

Step 3: Determine Release Height

For a **point source**, determine the **stack height**, which is the distance from ground level to the top of the stack.

Acceptable Stack Height. Although a taller stack provides better dispersion, there are limits to the degree to which this factor can be incorporated into the risk assessment. Rule 1401 specifies that the stack height used to determine risk shall not exceed the “Acceptable Stack Height” for the permit unit. Acceptable stack height is defined as 2.5 times the height of the equipment or 2.5 times the height of the building housing the equipment, and may not exceed 65 meters (213 feet), unless the applicant demonstrates to the satisfaction of SCAQMD staff that a greater height is necessary. For example, for a building that is 14 feet high, the acceptable stack height is 35 feet, measured from ground level.

For a **volume source**, determine the **building height**, which is the distance from ground level to the top of the building in which the permit unit is located, and the **floor area**, which is the dimensions (length x width) of the building in which the permit unit is located.

An **area source** is similar to a volume source in that the emissions take place over an area (as opposed to a point such as from a stack). However, in an area source, the pollutants are released at a uniform height. Examples of area sources are storage piles, slag dumps, lagoons or ponds, and liquid spills. Toxic hydrocarbon emissions from open top and floating roof storage tanks are also often treated as elevated area sources. Use Tier 3 or 4 for area sources.

Step 4: Determine Operating Schedule

Determine whether the equipment will operate:

- 12 hr/day or less; or
- more than 12 hr/day

Step 5: Identify the Appropriate Meteorological Station

Attachment M provides the locations of meteorological stations in the air basin used for these calculations. Using Figures 1 and 2, or the links below, determine the Source Receptor Area (SRA) for the permit unit. Use Tables 12.1 and 12.2 to determine the meteorological site associated with the permit unit's SRA.
http://www3.aqmd.gov/webappl/gisaqi2/VEMap3D.aspx; and
http://www.aqmd.gov/docs/default-source/default-document-library/map-of-monitoring-areas.pdf

Step 6: Identify Type of Receptor and Distance from Receptor

Identify the nearest receptor locations. Receptor locations are off-site locations where persons may be exposed to emissions of a TAC from the equipment. Receptor locations include residential, commercial, and industrial land use areas, and other locations where sensitive populations may be located.

Residential receptor locations include current residential land uses and areas that may be developed for residential uses in the future, based on existing and planned zoning.

Worker receptor locations include areas zoned for manufacturing, light or heavy industry, retail activity, or other locations that are regular work sites.

Sensitive receptor locations include any residence including private homes, condominiums, apartments, and living quarters, schools, preschools, daycare centers and health facilities such as hospitals, retirement and nursing homes, long term care hospitals, hospices in addition to prisons, dormitories or similar live-in housing.

When identifying receptor locations to calculate MICR, the potential for chronic (long-term) exposure should be considered. Land uses at which it is not possible for individuals to be exposed on a long-term basis, either presently or in the future, should not be considered receptor locations for purposes of calculating MICR. Examples of such locations include flood channels, or roadways.

For a <u>point source</u>, the receptor distance is the distance <u>from the center of the stack</u> to the nearest receptor location.

For a <u>volume source</u>, the receptor distance is the distance <u>from the edge of the building</u> to the nearest receptor location.

Experience shows that in most cases, the receptor distance will be 50 meters or more. However, the table also provides χ/Q values for a 25-meter distance. The 25-meter distance should be used for circumstances in which there is a receptor located very close to the permit unit, for example, a residence located with a business, another business adjacent to the facility, or a sensitive receptor located less than 50 meters from the permit unit.

If the closest receptor location is a worker receptor, then the MICR must also be calculated for the closest residential or sensitive receptor. The greater of the two MICR values is used to determine compliance with the risk limits in the rule.

Care should be taken when estimating these distances since concentrations decrease rapidly with increasing distance. It is acceptable to linearly interpolate to estimate dispersion factors between the downwind distances given in the tables. If the receptor lies over 1,000 meters from the permit unit, use the concentration for 1,000 meters.

Step 7: Select χ/Q Value

What is a Dispersion Factor (χ/Q)?

The concentration of a contaminant decreases as it travels away from the site of release and spreads out or "disperses." Dispersion factors (χ/Q) are numerical estimates of the amount of dispersion that occurs under specific conditions.

The amount of dispersion depends on the distance traveled, the height of release and meteorological conditions such as wind speed and atmospheric stability.

The dispersion factors for the screening risk assessment procedure give the estimated annual average ground-level concentration ($\mu g/m^3$) resulting from a source emitting one ton/year of a contaminant. For a more detailed explanation of derivation of χ/Q for each meteorological station, please refer to Appendix VI.

Several tables are provided for χ/Q, based on the source parameters and the meteorological station. Select the appropriate χ/Q value from the table based on the **meteorological station, source characteristics** (i.e., stack height for point sources and building height and building area for volume sources) and the **receptor distance.** The selection of the appropriate table is summarized below:

Release Type	Building Area	Stack Height	Operating Schedule of Equipment	Table for χ/Q
Point	N/A	≥ 14 ft to 24 ft	≤ 12 hr/day	Table 2.1
			> 12 hr/day	Table 3.1
		> 24 ft to 49 ft	≤ 12 hr/day	Table 2.2
			> 12 hr/day	Table 3.2
		> 49 ft	≤ 12 hr/day	Table 2.3
			> 12 hr/day	Table 3.3
Volume	≤ 3,000 ft^2	≤ 20 ft	≤ 12 hr/day	Table 4.1
			> 12 hr/day	Table 5.1
	> 3,000 ft^2 to 10,000 ft^2	≤ 20 ft	≤ 12 hr/day	Table 4.2
			> 12 hr/day	Table 5.2
	> 3,000 ft^2 to 10,000 ft^2	> 20 ft	≤ 12 hr/day	Table 4.3
			> 12 hr/day	Table 5.3
	> 10,000 ft^2 to 30,000 ft^2	≤ 20 ft	≤ 12 hr/day	Table 4.4
			> 12 hr/day	Table 5.4
	> 10,000 ft^2 to 30,000 ft^2	> 20 ft	≤ 12 hr/day	Table 4.5
			> 12 hr/day	Table 5.5
	> 30,000 ft^2	> 20 ft	≤ 12 hr/day	Table 4.6
			> 12 hr/day	Table 5.6

Alternative Sets of Dispersion Factors (χ/Q) for Tier 2 Analysis Only

SCAQMD staff has developed alternative sets of dispersion factors to be used by certain industry or equipment categories. The Tier 2 χ/Q values for those categories are contained in separate appendices to this document along with supporting information as to how they were developed. Appendix VII contains χ/Q values for combustion sources such as diesel reciprocating internal combustion engines rated 50 bhp to 1,149 bhp, natural gas reciprocating internal combustion engines rated 50 bhp to 1,000 bhp, and natural gas boilers with an hourly rating of no more than 200 MMBTU/hr. Appendix VIII contains χ/Q values for crematoriums. Appendix IX contains χ/Q values for short-term projects. Appendix X contains χ/Q values for gasoline dispensing facilities. Appendix XI contains χ/Q values for spray booths.

Step 8: Identify Molecular Weight Adjustment Factor (MWAF)

Using Table 8.1, identify the Molecular Weight Adjustment Factor (MWAF) for the TAC.

What is a Molecular Weight Adjustment Factor (MWAF)?

MWAFs should be used when calculating the cancer risk, . For most of the Hot Spots toxic metals, the OEHHA cancer potency factor applies to the weight of the toxic metal atom contained in the overall compound. This ensures that the cancer potency factor is applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal.

For most of the Hot Spots toxic metals, the OEHHA cancer potency factors, acute and chronic RELs apply to the weight of the toxic metal atom contained in the overall compound. Some of the Hot Spots compounds contain various elements along with the toxic metal atom (e.g., "Nickel hydroxide", CAS number 12054-48-7, has a formula of H_2NiO_2). Therefore, an adjustment to the reported pounds of the overall compound is needed before applying the OEHHA cancer potency factor for "Nickel and compounds" to such a compound. This ensures that the cancer potency factor, acute or chronic REL is applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal. In other cases, the Hot Spots metals are already reported as the metal atom equivalent (e.g., CAS 7440-02- , "Nickel"), and these cases do not use any further molecular weight adjustment. The appropriate molecular weight adjustment factors (MWAF) to be used along with the OEHHA cancer potency factors, acute and chronic RELs for Hot Spots metals can be found in the MWAF column of the table containing OEHHA/ARB Approved Health Values for use in Hot Spots Facility Risk Assessments.

Step 9: Identify Cancer Potency Factor (CP) and Reference Exposure Level (REL)

Using Table 8.1, identify the cancer potency factor (CP) for the TAC.

What is a Cancer Potency Factor (CP)?

The cancer potency factor is a measure of the cancer potency of a carcinogen. Cancer potency describes the potential risk of developing cancer per unit of average daily dose over a 70-year lifetime.

The cancer potency factors in these procedures were approved by the state Scientific Review Panel and prepared by the state Office of Environmental Health Hazard Assessment (OEHHA).

What is a Reference Exposure Level (REL)?

The concentration level at or below which no adverse health effects are anticipated for a specified exposure duration is termed the reference exposure level (REL). RELs are based on the most sensitive, relevant, adverse health effect reported in the medical and toxicological literature. RELs are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact.

Step 10: Identify Multi-pathway Factor (MP)

Using Table 8.1, identify the multi-pathway adjustment (MP) factor for the TAC, if applicable.

What is a Multi-Pathway Adjustment Factor (MP)?

The multi-pathway adjustment factor (MP) is used for substances that may contribute to risk from exposure pathways other than inhalation. These substances deposit on the ground in particulate form and contribute to risk through ingestion of soil or backyard garden vegetables or through other routes. The MP factor estimates the total risk in comparison to a given inhalation risk. MP factors are provided in Table 8.1.

These factors allow permit units that emit multi-pathway pollutants to use the risk screening procedure rather than proceeding directly to preparing a detailed risk assessment.

The MP factors are to be used only in urban residential or worker exposure situations. Note that there are separate MP factors for worker (MP_W), resident (MP_R) and short-term ($MP_{R,ST}$ and $MP_{W,ST}$) exposure (see Table 8.1 and Tables 9.11 to 9.32 in Appendix IX) since their potential routes and duration of exposure varies. If the facility is in the vicinity of other potential routes of population exposure such as agricultural areas, drinking water reservoirs, lakes or ponds used for fish that are consumed regularly, or areas used for livestock grazing, then these MP screening assumptions are not appropriate and a more detailed multi-pathway assessment (Tier 4) must be performed.

For a more detailed description of the derivation of the multipathway factors, please see Appendix II.

Step 11: Select Combined Exposure Factor (CEF)

Using Tables 9.1 and 9.2, select the appropriate CEF. The CEF for each exposure type (residential, worker, or short-term) combines default exposure parameters for DBR, ASF, ED, FAH, EF, and AT into a single value.

What are Daily Breathing Rate (DBR) Values?

Exposure to airborne chemicals occurs through inhalation and subsequent absorption into the body, potentially resulting in adverse health effects depending on toxicological properties of the chemical and other exposure parameters. For residential exposures, the breathing rates are determined for specific age groups (i.e., 3rd trimester, 0-2, 2-16, and 16-30 years). The Air Resources Board is developing an updated Risk Management Policy that includes recommendations for inhalation exposures. Information regarding ARB's Risk Management Policy (RMP) can be located at: http://www.arb.ca.gov/toxics/toxics.htm. For residential exposures, ARB's RMP recommends using the high end DBR (e.g., 95th percentile) for children from the 3rd trimester through age 2, and 80th percentile DBR for all other ages. This is reflected in Tables 9.1 and 9.2. For worker exposures, it is assumed that the working age begins at 16 years, and that exposures to facility emissions occur during the work shift which is typically up to 8 hours per day during work days.

What is Age Sensitivity Factor (ASF)?

Scientific data have shown that young animals are more sensitive than adult animals to exposure to many carcinogens. Therefore, OEHHA has developed age sensitivity factors (ASFs) to take into account the increased sensitivity to carcinogens during early-in-life exposure. OEHHA recommends an ASF of 10 for exposures that occur from the third trimester of pregnancy to 2 years, and an ASF of 3 for exposures that occur from 2 years through 15 years of age.

What is Exposure Duration (ED)?

A 30-year ED (residency time) should be used for residential and sensitive receptor locations. A 25-year ED should be used for off-site workers (i.e., receptor locations in commercial or industrial areas).

What is Fraction of Time Spent At Home (FAH)?

OEHHA and ARB have evaluated information from activity patterns databases to estimate the percentage of the day that people are at home. This information is used to adjust cancer risk from a facility's emissions, assuming that exposure to the facility's emissions are not occurring away from home. The FAH factor does not apply for workers since the worker is assumed to be present at the work site 100% of the work day. For Tiers 1, 2, and 3 screening purposes, the FAH is assumed to be 1 for ages 3rd trimester to 16. As a default, children are assumed to attend a daycare or school in close proximity to their home and no discount should be taken for time spent outside of the area affected by the facility's emissions. People older than age 16 are assumed to spend only 73% of their time at home.

What is Exposure Frequency (EF)?

Exposure Frequency (EF) is the number of days per year of exposure for the given scenario (i.e. residential, worker). OEHHA recommends use of 350 days/year for residential exposure (applicable to 30-year risk assessments), and 250 days/year for worker exposure.

What is Average Time (AT)?

Averaging Time (AT) is the lifetime exposure period OEHHA used to develop the cancer potency values. Cancer Potency (CP) factors are developed as estimates of cancer risk from exposure to a lifetime dose (i.e. 70 years) of a carcinogen. Since cancer risks are calculated on a yearly basis to account for age-specific factors (e.g., ASF, DBR, etc.) the CP factor must be divided by its original 70-year AT in the risk equation to generate an annual CP factor to be used in the cancer risk calculations. For AT, OEHHA recommends the use of 70 years.

Step 12: Calculate Worker Adjustment Factor (WAF)

What is Worker Adjustment Factor (WAF)?

In risk assessments, long-term averages are typically used for cancer risk calculations for residents and workers. Therefore, for an offsite worker, the long-term average should represent what the worker breaths during their work shift. However, the long-term averages calculated from AERMOD typically represent exposures for receptors that were present 24 hours a day and seven days a week which is the schedule of a residential receptor. When modeling a non-continuously emitting source (e.g., operating for 8 hours per day and 5 days per week), the long-term concentration has to be adjusted so that it is only based on the hours when the worker is present. WAF is the ratio between residential exposure and facility schedule. For screening purposes, the offsite worker schedule is assumed to always overlap with the facility's operating schedule.

For sources operating and emitting continuously (24 hours per day and 7 days per week), the worker is assumed to breathe the long-term annual concentration during their work shift and no adjustments are necessary when estimating the cancer risk. In these cases, the WAF is equal to one. For non-continuous sources operating, the appropriate WAF can be calculated using the following equation:

$$WAF = (H_{residential} / H_{source}) \times (D_{residential} / D_{source})$$

Where;

WAF	=	Worker adjustment factor
$H_{residential}$	=	The number of hour per day the long-term concentration is based on (always 24 hours)
H_{source}	=	The number of hours the source operates per day
$D_{residential}$	=	The number of days the per week the long-term residential concentration is based on (always 7 days)
D_{source}	=	The number of days the source operates per week

Although the 2015 OEHHA Guidance Manual allows the use of a discount factor (DF) when assessing inhalation cancer health impacts, if the offsite worker's schedule partially overlaps with the source's emission schedule, the DF should only be used when there are limits on the hours of operation specified in the facility's operating permits. Since SCAQMD permits do not typically include limits on the hours of operation, it is not appropriate to apply the DF when calculating the health impacts.

MICRs for Multiple Toxic Air Contaminants

If the equipment emits more than one TAC, the total MICR must be calculated. The total MICR is the sum of the MICRs for each of the TACs emitted by the equipment.

INSTRUCTIONS FOR CALCULATING CANCER BURDEN

The cancer burden is the estimated increase in the occurrence of cancer cases in a population as a result of exposures to TAC emissions from the equipment. The cancer burden for a population unit (city, census tract, sub-area or grid) is the product of the number of persons in the population and the estimated individual risk from TACs. The cancer burden only needs to be calculated if the MICR is greater than one (1) in one million.

The following procedure may be used to perform an acceptable screening analysis for cancer burden due to a single source of TAC:

- Calculate total MICR from all TACs from a single permit unit as previously outlined.

- Estimate the distance at which the MICR falls below one in one million. This distance can be estimated by back-calculating the distance that would result in a MICR of one in one million, using the χ/Q values in Tables 2.1 thru 5.6.

- Define a zone of impact in the shape of a circle. The radius (r) of this circle is the distance between the equipment and the point at which the risk falls below one in one million. The area of this circle is calculated using the equation for the area of a circle, which is $3.14 \times r^2$.

- Estimate the residential population within this zone of impact based on census data or a worst-case estimate. Generally, the residential population in the Basin is less than 4,000 persons/km^2, but some areas are as high as 7,000 persons/km^2.

  For areas where census data is available, it should be used. Where there is no census data, 7,000 persons/km^2 should be used for the areas with high population densities and 4,000 persons/km^2 should be used for areas with low population densities. Where the population densities are unknown, use 7,000 persons/km^2.

- Calculate the screening level cancer burden by multiplying the total residential population in the zone of impact by the maximum individual cancer risk.

If the dispersion factors in Tables 2.1 thru 5.6 are not sufficient to estimate the distance at which MICR falls below one in one million, then a more refined risk assessment is warranted.

INSTRUCTIONS FOR CALCULATING CHRONIC, 8-HOUR, AND ACUTE HAZARD INDEX (HIC, HIC8, AND HIA)

Some TACs have the potential to cause non-cancer health risk due to short term (acute) or long term (chronic) exposures. The screening risk assessment for those TACs must estimate acute, 8-hour, and/or chronic hazard indexes as applicable. Like the calculation procedure for MICR, one must first identify when the application was deemed complete and select the appropriate set of risk tables found in the attachments (e.g. Attachment M, Attachment L, etc).

Reference Exposure Level (REL) is used as an indicator of potential adverse non-cancer health effects. An inhalation REL is a concentration level ($\mu g/m^3$) at which no adverse health effects are anticipated. Inhalation RELs are provided in Table 8.1.

When a health impact calculation is performed for a single substance, it is called the **Hazard Quotient (HQ)**. When several TACs affect the same organ system in the body (e.g., respiratory system, nervous system, reproductive system), there can be a cumulative effect on the target organ. In these cases, the sum of the Hazard Quotients of all chemicals emitted that impact the same target organ called total **Hazard Index (HI)** is evaluated.

Detailed procedures for calculating the total hazard index are provided in the 2015 OEHHA Guidance Manual. The equations used to calculate the chronic, 8-hour chronic, and acute Hazard Index (HIC, HIC8 and HIA) per target organ are as follows:

$$\text{Total HIC}_{\text{target organ}} = \{[Q_{tpy,TAC1} \times (\chi/Q) \times MP_{TAC1} \times MWAF]/\text{Chronic REL}_{TAC1}\}_{\text{target organ}} + \{[Q_{tpy,TAC2} \times (\chi/Q) \times MP_{TAC2} \times MWAF]/\text{Chronic REL}_{TAC2}\}_{\text{target organ}} + \ldots$$

$$\text{Total HIC8}_{\text{target organ}} = \{[Q_{tpy,TAC1} \times (\chi/Q) \times WAF \times MWAF]/\text{8-Hour REL}_{TAC1}\}_{\text{target organ}} + \{[Q_{tpy,TAC1} \times (\chi/Q) \times WAF \times MWAF]/\text{8-Hour REL}_{TAC2}\}_{\text{target organ}} + \ldots$$

$$\text{Total HIA}_{\text{target organ}} = \{[Q_{lbph,TAC1} \times (\chi/Q)_{hr} \times MWAF]/\text{Acute REL}_{TAC1}\}_{\text{target organ}} + \{[Q_{lbph,TAC2} \times (\chi/Q)_{hr} \times MWAF]/\text{Acute REL}_{TAC2}\}_{\text{target organ}} + \ldots$$

Note that the chronic HI is based upon an annual average emission per year whereas the acute HI is based upon a maximum one-hour emission level and the acute HI does not use a multi-pathway adjustment factor (MP). In addition, the 8-hour RELs were developed only for repeated, chronic daily 8-hour exposures (e.g. a typical worker or resident exposed to a facility that operates equal to or more than 8 hours per day and 5 days per week). The 8-hour HI is based upon the daily average 8-hour exposure only for those chemicals with 8-hour RELs. There are currently only a limited number of substances with an 8-hour inhalation REL. (See Table 8.1)

PROCEDURE FOR ALTERNATE HAZARD INDEX LEVEL EXEMPTION

Rule 1401 provides an exemption from the hazard index limit of one in cases in which a higher exposure level is deemed to be safe. This exemption has never been used. Under this exemption, the HIC and/or HIA limit of one does not apply if the applicant substantiates to the satisfaction of SCAQMD staff that at all receptor locations and for every target organ system, the total chronic and acute HI levels resulting from emissions from the equipment will not exceed alternate HI levels determined by OEHHA to be protective against adverse health effects. This applies only to TACs listed in Rule 1401 at the time the application was deemed complete. Refer to the attachments for the appropriate list of TACs.

Applicants should indicate in their permit application that they wish to apply for an exemption under the alternative hazard index provisions of the rule. The permit application should include both a risk assessment estimating the HIA and HIC levels and relevant information supporting the exemption. Depending on the particular health risks in question, additional information such as characterization of the surrounding population, the location of sensitive receptors, or other data may be required.

SCAQMD staff will consult with OEHHA staff regarding the request for the alternative HI level. If OEHHA staff finds that the levels of exposure to the public will not exceed levels that are protective against adverse health effects, the application will be eligible for the exemption.

In some cases, OEHHA staff may establish a general policy recommending different acceptable exposure levels for different exposed populations. For example, if exposure to a certain compound is particularly harmful to children but less of a concern for adults, OEHHA staff may determine as a general policy that higher exposure levels are acceptable in locations where children would not be exposed. OEHHA policy in these cases would be a basis for eligibility for the alternate hazard index exemption.

Tier 3: Screening Dispersion Modeling

Tier 3 uses a screening dispersion model to estimate risk. This tier requires more expertise than Tiers 1 and 2. For guidance on performing a Tier 3 analysis, refer to the SCAQMD webpage at: http://www.aqmd.gov/home/permits/risk-assessment.

Tier 3 screening dispersion modeling should only be used for a equipment with a single emission or release point. If there are multiple emission or release points, Tier 4 must be used. In addition, Tier 3 would only be beneficial for applications involving source parameters that differ substantially from those used to derive χ/Q values in Tables 2.1 thru 7.1 and Appendices VI through XI.

To perform a Tier 3 analysis, the following is needed:

- Air dispersion modeling expertise;
- An EPA-approved screening dispersion model program such as AERSCREEN, which can be downloaded from www.epa.gov/scram001; and
- Additional equipment information such as stack gas temperature, stack gas exit velocity or flow rate, stack inside diameter, and albedo, Bowen ratio, and surface roughness of the appropriate meteorological station.

It should be noted that AERSCREEN estimates peak one-hour concentrations for HIA calculations. For the MICR and HIC calculations, use the annual average concentration estimated in the AERSCREEN output. Note that when modeling an area source in AERSCREEN, only the one-hour concentration is estimated. The EPA's user's guide for screening models states the following for area sources: "Do not use the multiplying factors to correct for averaging times greater than 1 hour. Concentrations close to an area source will not vary as much as those for point sources in response to varying wind directions, and the meteorological conditions which are likely to give maximum 1-hour concentrations can persist for several hours. Therefore it is recommended that the maximum 1-hour concentration be conservatively assumed to apply for averaging periods out to 24 hours."

In a Tier 3 approach, the Tier 2 equations for MICR, HIC, and HIA continue to be used except that a screening dispersion model is used to estimate each pollutant concentration. Thus, the Tier 3 equations to be used are as follows:

$$\mathbf{MICR_R = CP \times PeakConc \times CEF_R \times MP_R \times 10^{-6} \times MWAF}$$

$$\mathbf{MICR_W = CP \times PeakConc \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF}$$

$$\mathbf{Total\ HIC_{target\ organ} = \Sigma\ \{[AveConc_{TAC} \times MP \times MWAF]/Chronic\ REL_{TAC}\}_{target\ organ}}$$

$$\mathbf{Total\ HIC8_{target\ organ} = \Sigma\ \{[AveConc_{TAC} \times WAF \times MWAF]/8\text{-}Hour\ REL_{TAC}\}_{target\ organ}}$$

$$\mathbf{Total\ HIA_{target\ organ} = \Sigma\ \{[PeakConc_{TAC} \times MWAF]/Acute\ REL_{TAC}\}_{target\ organ}}$$

PeakConc is the peak one-hour pollutant concentration estimated by AERSCREEN and AveConc is the annual average concentration in the AERSCREEN output file. Refer to the section on Tier 2, Screening Risk Assessment for explanation of the other variables in the equations.

If the MICR, HIC, HIC8, and HIA do not exceed the rule limits, then the equipment complies with Rule 1401 and no further analysis is required. If any risk value exceeds the rule limits, then proceed to Tier 4.

Tier 4: Detailed Risk Assessment

Tier 4 is a detailed risk assessment using the Hotspots Analysis and Reporting Program Version 2 (HARP 2) software developed by ARB which replaces the prior version and incorporates the information in the 2015 OEHHA Guidance Manual. The HARP 2 software and documentation can be obtained at http://www.arb.ca.gov/toxics/harp/harp.htm. The U.S. EPA air quality dispersion model called AERMOD is used by HARP 2 to estimate the concentration of pollutants in place of the previously used ISCST3 model. ISCST3 dispersion modeling will no longer be allowed for determining TAC concentrations. ARB recommends AERMOD for Hot Spots risk assessments. AERMOD documentation is available at: http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod. Meteorological data for use in HARP 2 and AERMOD can be downloaded from http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod.

Tier 4 is an option if neither Tier 2 nor Tier 3 can demonstrate compliance, or if the applicant wishes to obtain a more refined estimate of the cancer and non-cancer risk. Since Tier 4 involves detailed modeling using actual meteorological data from the closest air monitoring station, it will often result in a less conservative estimate of the risk than either Tiers 2 or 3. Tier 4 modeling will be most useful for analyses that have source parameters that differ substantially from defaults in Tables 2.1 through 7.1 and Appendices VI through XI, and/or analyses whose closest receptors do not lie immediately downwind of the emission sources.

A detailed risk assessment should be performed by individuals with experience and training in air quality modeling and risk assessment. In addition, SCAQMD modeling staff should be consulted before performing a detailed risk assessment. For guidance on performing a detailed risk assessment, refer to SCAQMD webpage at: http://www.aqmd.gov/home/permits/risk-assessment.

Written guidance on preparing a detailed risk assessment is contained in an OEHHA document titled, "Air Toxics Hot Spots Program Risk Assessment Guidelines (February 2015)" which may be obtained at: http://www.oehha.ca.gov/air/hot_spots/hotspots2015.html.

SCAQMD modeling staff has prepared supplemental risk assessment guidance which must be followed by all applicants submitting Tier 4 assessments. SCAQMD's supplemental guidance is available at: http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588/health-risk-assessment. Lastly, SCAQMD guidance on using AERMOD can be found at: http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/modeling-guidance.

EXAMPLE 1: MICR, CANCER BURDEN, & HIC CALCULATION

The facility does not have operating schedule restrictions and is located in an industrial and residential area. Chromium 6+ (hexavalent chromium) is emitted from the manufacturing process from one piece of equipment, which is fitted with control equipment considered as T-BACT. Chromium 6+ is a carcinogen and has chronic non-carcinogenic risks.

The application was deemed complete on July 15, 2015.
The nearest receptor distances:
Worker (Industrial) = 328 feet (100 meters)
Residential = 492 feet (150 meters)
Operating Schedule: 24 hours/day, 7 days/week since no schedule restrictions are included in the permit conditions.
Stack height = 28 ft
Facility location: Ontario, CA
TACs: Chromium 6+

Emission rates for the TACs are listed in Table A below.
Note: The maximum hourly emissions should be estimated based on the maximum operating parameters in any hour.

Table A

TAC	**Emission Rate**		
	Q_{lbph} (lbs/hr)	**Q_{lbpy} (lbs/yr)**	**Q_{tpy} (tons/yr)**
Chromium 6+	2.63E-07	2.30E-03	1.15E-06

(The list of TACs and their corresponding emission rates are for illustration purposes only. They may not reflect actual conditions.)

First, identify the appropriate risk assessment tables (included in the appendices) based upon when the application was deemed complete. In this case, the tables for applications deemed complete on or after July 5, 2015 (i.e., Permit Application Package "M") are used.

Second, calculate MICR for those TACs that have Inhalation Cancer Potency Values from Table 8.1. Table B below identifies the TACs and their corresponding inhalation cancer potency values for MICR calculations.

Table B

TAC	**Inhalation Cancer Potency (CP)** (mg/kg-day)$^{-1}$
Chromium 6+	5.10E+02

Based on the above table, MICR will be evaluated for residential and worker receptors for chromium 6+.

From Table 8.1, we can also determine if the emitted pollutant is carcinogenic, chronic, 8-hour chronic, and/or acute. The results are as follows:

TAC	**MICR (cancer)**	**HIC (chronic)**	**8-hr HIC (chronic)**	**HIA (Acute)**
Chromium 6+	√	√ (MP)		

MP indicates that the multi-pathway adjustment factor will be different than 1.0.

Next, for chronic and acute substances, review Tables 11.1, 11.2 and 11.3 to determine the target organs affected by TACs due to chronic and/or acute toxicity. Table C below indicates the target organs affected by the chronic TACs with chronic toxicity. In the table, check marks (√) indicate the affected target organs.

Table C (Chronic Toxicity)

TAC	**AL**	**BN**	**CV**	**DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**REP**	**RESP**	**SKIN**
Chromium 6+							√					√	

HEM: Hematopoietic system
RESP: Respiratory system

Since no chronic 8-hour and acute health values have been adopted in Rule 1401 for chromium 6+, no target organs have been identified for those impacts.

Tier 1: Screening Emission Levels

The nearest receptor location should be used, in this case the worker location of 100m should be used.
Please note that this step is used to approximate the equipment's potential risk.

For Tier 1, the equipment's TACs emissions (annual and/or maximum hourly) should be compared with the Screening Levels for the chromium 6+ in Table 1.1 as appropriate. The annual emission rate for chromium 6+ in Table 1.1 is 4.31E-04 pounds per year at a distance of 100m. No maximum hourly emissions are presented in Table 1.1 because no acute value has been adopted in Rule 1401 for chromium 6+.

Please note that the cumulative cancer/chronic risk cannot exceed the emissions presented in Table 1.1. In this example, this facility did not pass Tier I since the annual emissions (2.30E-03 lb/yr) are greater than those presented in Table 1.1 (4.31E-04 lb/yr) and would have to proceed to Tier 2 to demonstrate compliance with Rule 1401.

Tier 2: Screening Risk Assessment

Step 1: Estimate Emission Rate (Q_{tpy})

According to Table A of the example, **Q_{tpy} = 1.15E-06**.

Step 2: Determine Release Type

The TAC is released from one piece of equipment fitted with control equipment. This would be treated as a **point source**.

Step 3: Determine Release Height

The piece of equipment has a stack height of **28 feet**.

Step 4: Determine Operating Schedule

The equipment can operate 24 hours/day and 7 days/week as there are no restrictions on hours of use. Therefore, the operating schedule is **more than 12 hours/day**.

Step 5: Identify the Appropriate Meteorological Station

The facility is located in Ontario and according to Figure 1 in Attachment M, the closest monitoring station is **Upland**.

Step 6: Identify Type of Receptor and Distance from Receptor

There are two identified receptor types **– a worker receptor located 100 meters** away and a **residential receptor located 150 meters** away.

Step 7: Select χ/Q Value

Since the point source operates more than 12 hours/day and is 28 feet high, the χ/Q values from Table 3.2 for Upland at a distance of 100 meters (**4.35**) and 150 meters (**2.97**) were used. The χ/Q value at 150 meters was interpolated between 100 meters and 200 meters.

Step 8: Identify MWAF

The MWAF value for Chromium 6+ (**1**) was found in Table 8.1.

Step 9: Identify CP and REL

The CP value (**5.10E+02**) and chronic REL value (**2.00E-01**) for Chromium 6+ was found in Table 8.1. Note that there is no acute REL value for Chromium 6+.

Step 10: Identify MP

The MP values (**Cancer MP_R = 1.60, Cancer MP_W = 1.02, Chronic MP_R = 2.44, Chronic MP_W = 1.00**) for Chromium 6+ was found in Table 8.1.

Step 11: Select CEF

The CEF values (**CEF_R = 676.63, CEF_W = 56.26**) for residential and worker exposures were found in Tables 9.1 & 9.2.

Step 12: Calculate WAF

Since the point source operates 24 hours/day and 7 days/week, the WAF value (**1.0**) was found in Table 10.2.

MICR Calculation

(1) Worker: **$MICR_W = CP \times Q_{tpy} \times \chi/Q \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF$**

TAC	CP	Q_{tpy}	χ/Q	CEF_W	MP_w	WAF	MWAF	MICR
Chromium 6+	5.10E+02	1.15E-06	4.35	56.26	1.02	1	1	1.46×10^{-7}

(2) Resident: **$MICR_R = CP \times Q_{tpy} \times \chi/Q \times CEF_R \times MP_R \times 10^{-6} \times MWAF$**

TAC	CP	Q_{tpy}	χ/Q	CEF_R	MP_R	MWAF	MICR
Chromium 6+	5.10E+02	1.15E-06	2.97	676.63	1.60	1	1.89×10^{-6}

Please note that the higher of the worker and residential cancer risks needs to be selected. This value will be entered in MICR field in the NSR, 1401 section. In this example, the maximum cancer risk is at the residential receptor.

Cancer Burden Calculation

Cancer burden should always be calculated if the MICR exceeds one in a million, regardless of the type of receptor. Since the cancer risk at the residential receptor was calculated to be **1.89×10^{-6}**, the cancer burden needs to be calculated.

Estimate of distance at which MICR falls below one in one million.

The distance at which the MICR falls below one in one million requires you to take the reciprocal of the calculated MICR multiplied by 1.0×10^{-6}. This factor (F) will be the multiplier to the χ/Q value used in determining the MICR.

$$F = (1 / MICR) \times 1.0 \times 10^{-6}$$

$$F = (1 / 1.89 \times 10^{-6}) \times 1.0 \times 10^{-6}$$

$$F = 0.529$$

Determination of the new downwind distance will be based upon a new χ/Q value calculated by multiplying the originally used χ/Q value by F.

Therefore,

$$\text{New } \chi/Q = 2.97 \times 0.529$$

$$\text{New } \chi/Q = 1.57$$

Using Table 3.2, the new χ/Q lies between downwind distances of 200 to 300 meters. Interpolating for the new downwind distance gives is 201 meters.

This new Downwind Distance is where the MICR will fall below one in one million.

Define Zone of Impact

The zone of impact (ZI) is calculated using the New Downwind Distance as the radius of a circle and calculating the area of that circle.

Therefore,

$$ZI = 3.14\, r^2$$

$$ZI = 3.14\, (0.201\ km)^2$$

$$ZI = 0.13\ km^2$$

Estimate the population within the ZI

ZI should include both worker and residential populations.

For areas where census data is available, it should be used. Where there is no census data, 7,000 persons/km^2 should be used for the areas with high population densities and 4,000 persons per square kilometer should be used for areas with low population densities. Where the population densities are unknown, use 7,000 persons per square kilometer.

In this example we have no information on census data or population density, therefore,

Zone of Impact Population = ZI x Population Density

Zone of Impact Population = 0.13 km^2 x 7,000 person/ km^2

Zone of Impact Population = 910 persons

Calculate Cancer Burden

For a screening level analysis, the cancer Burden (CB) is estimated using the zone of impact population multiplied by the calculated MICR.

Therefore,

CB = 910 persons x 1.89 x 10^{-6}

CB = 0.00172

Hazard Index Calculations

Chronic, 8-hour chronic and acute hazard indices should be calculated for each target organ. Since no acute or 8-hr chronic health values have been adopted for chromium 6+, only the chronic hazard index is estimated.

Chronic Hazard Index:

$$\mathbf{HIC = \Sigma\,[(Q_{tpy})\ x\ (\chi/Q)_{chronic}\ x\ MP\ x\ MWAF]/(Chronic\ REL)}$$

Based on Table 11.1, the target organs for the TACs for chronic toxicity have been listed in Table C. The Chronic Hazard Index for the TACs in this example are calculated as follows:

Chromium 6+:

Affects hematopoietic and respiratory systems.

Worker: HIC = [1.15E-06 x 4.35 x 1.00 x 1] / (2.00E-01) **= 2.5E-05**

Resident: HIC = [1.15E-06 x 2.97 x 2.44 x 1] / (2.00E-01) **= 4.2E-05**

Since there is only one TAC, the HI does not need to be summed across the target organs.

Summary of Results

	MICR	**HIC**	**HIC8**	**HIA**
Worker	1.46×10^{-7}	2.5E-05	N/A	N/A
Resident	1.89×10^{-6}	4.2E-05	N/A	N/A
Rule 1401 Threshold	10×10^{-6}	1	1	1
Exceeds Threshold?	No	No	N/A	N/A

RESULT:

- ***MICRs for residential and commercial receptors do not exceed 10 x 10^{-6} (ten in one million).***
- ***Cancer burden is less than 0.5.***
- ***HICs for residential and commercial receptors are less than 1.***
- ***There are no health values associated with the chronic 8-hour or acute exposures and those hazard indices have not been calculated.***

The equipment in this example contains T-BACT; therefore, it would pass the Rule 1401 MICR limit. A Tier 3 or 4 analysis is not necessary.

EXAMPLE 2: MICR, CANCER BURDEN, HIC, HIC8, & HIA CALCULATIONS

An industrial operation generates benzene, arsenic and dioxin emissions.

The application was deemed complete on July 15, 2015.
Volume source: Building dimensions 40'(W) x 70'(L) x 17'(H)
The nearest receptor distances are:
Worker (Industrial) = 100 meters
Residential = 500 meters
Permitted Operating Schedule: 8 hr /day, 5 days/wk, 50 wks/yr = 2,000 hours/year
Facility location: Azusa, CA
TACs: Arsenic, Benzene, Dioxin, Nickel hydroxide.

Emission rates for the TACs are listed in Table A below.
Note: The maximum hourly emissions should be estimated based on the maximum operating parameters in any hour.

Table A

TAC	Emission Rate		
	Q_{lbph} (lbs/hr)	Q_{lbpy} (lbs/yr)	Q_{tpy} (tons/yr)
Arsenic	8.30E-06	1.66E-02	8.30E-06
Benzene	7.50E-03	1.50E+01	7.50E-03
Dioxin	6.10E-10	1.22E-06	6.10E-10
Nickel hydroxide	2.30E-03	4.60E+00	2.30E-03

(The list of TACs and their corresponding emission rates are for illustration purposes only. They may not reflect actual conditions.)

First, identify the appropriate risk assessment tables (included in the appendices) based upon when the application was deemed complete. In this case, the tables for applications deemed complete on or after July 5, 2015 (i.e., Permit Application Package "M") are used.

Second, calculate MICR for those TACs that have Inhalation Cancer Potency Values from Table 8.1. Table B below identifies the TACs and their corresponding inhalation cancer potency values for MICR calculations.

Table B

TAC	**Inhalation Cancer Potency (CP)** (mg/kg-day)$^{-1}$
Arsenic	$1.20 \times 10^{+1}$
Benzene	1.00×10^{-1}
Dioxin	$1.30 \times 10^{+5}$
Nickel hydroxide	9.10×10^{-1}

Based on the above table, MICR will be evaluated for residential and worker receptors for arsenic, benzene, dioxin, and calcium chromate.

From Table 8.1, we can also determine if the emitted pollutant is carcinogenic, chronic, 8-hour chronic, and/or acute. The results are as follows:

TAC	**MICR (cancer)**	**HIC (chronic)**	**8-hr HIC (chronic)**	**HIA (Acute)**
Arsenic	√ (MP)	√ (MP)	√	√
Benzene	√	√	√	√
Dioxin	√ (MP)	√ (MP)		
Nickel hydroxide	√	√		

MP indicates that the multi-pathway adjustment factor will be different than 1.0.

Next, for chronic and acute substances, review Tables 11.1, 11.2 and 11.3 to determine the target organs affected by TACs due to chronic and/or acute toxicity. Tables C, D, and E below indicate the target organs affected by the TACs with chronic toxicity, chronic 8-hour toxicity, and acute toxicity, respectively. In the table, check marks (√) indicate the affected target organs.

Table C (Chronic Toxicity)

TAC	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic			√	√						√	√	√	√
Benzene							√						
Dioxin	√			√	√		√				√	√	
Nickel hydroxide				√			√				√	√	

AL: Alimentary system (liver)
BN: Bones and teeth
CV: Cardiovascular system
DEV: Developmental
END: Endocrine system
EYE: Eye
HEM: Hematopoietic system
IMM: Immune system
KID: Kidney
NS: Nervous system
REP: Reproductive system
RESP: Respiratory system
SKIN: Skin

Table D (Chronic 8-hour Toxicity)

TAC	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic			√	√						√	√	√	√
Benzene							√						
Dioxin													
Nickel hydroxide								√				√	

Table E (Acute Toxicity)

TAC	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic			√	√						√	√		
Benzene				√			√	√			√		
Dioxin													
Nickel hydroxide								√					

Tier 1: Screening Emission Levels

The nearest receptor location should be used, in this case the worker location of 100m should be used.

For Carcinogenic and/or Chronic Compounds:

Calculate the Pollutant Screening Index for each pollutant (PSI_P).

$$PSI_P = Q_{lbpy,P} / PSL_P$$

The Q_{lbpy} is based upon the annual emissions of each TAC (lbs/yr). The PSLs are found in Table 1.1 and are expressed in lb/yr.

Sum up the individual Pollutant Screening Indices for each pollutant ($\sum PSI_P$).

TAC	$Q_{lbpy,P}$	PSL_P	PSI_P
Arsenic	1.66E-02	3.01E-03	5.51
Benzene	1.50E+01	3.51E+00	4.27
Dioxin	1.22E-06	2.70E-06	0.45
Nickel hydroxide	4.60E+00	6.09E-01	7.55
		$\sum PSI_P$ =	**17.85**

Calculate the Application Screening Index (ASI).

$$ASI_{cancer\ and/or\ chronic} = \Sigma\ PSI_P = 17.85$$

For Acute Compounds:

Calculate the Pollutant Screening Index for each pollutant (PSI_P).

$$PSI_P = Q_{lbph,P} / PSL_P$$

The Q_{lbph} is based upon the maximum hourly emissions (lb/hr). The PSLs for acute compounds are found in Table 1.1 and are expressed in lb/hr.

Sum up the individual pollutant screening indices for each acute pollutant ($\sum PSI_P$).

TAC	$Q_{lbph,P}$	PSL_P	PSI_P
Arsenic	8.30E-06	8.91E-04	9.32E-03
Benzene	7.50E-03	1.20E-01	6.25E-02
Nickel hydroxide	2.30E-03	1.41E-03	1.63E+00
		$\sum$ PSIp =	**1.70**

Calculate the Application Screening Index (ASI).

$$ASI_{acute} = \Sigma\ PSI_P = 1.70$$

Please note that the cumulative cancer/chronic risk and the cumulative acute hazard index exceeded 1. In this example, this facility did not pass Tier 1 as the ASI exceeded 1 for cancer/chronic and acute. Since this Tier I screening was calculated to be greater than 1, the applicant would have to proceed with further health risk screening assessment procedures.

Tier 2: Screening Risk Assessment

Step 1: Estimate Emission Rate (Q_{tpy})

The emission rates are listed in Table A of the example.

Step 2: Determine Release Type

The TAC is released from a building with dimensions of 40’ x 70’ (2,800 ft^2 area) and height of 17 feet. This would be treated as a **volume source**.

Step 3: Determine Release Height

Since the source is a volume source, the release height is not relevant.

Step 4: Determine Operating Schedule

The facility operates 8 hours/day and 5 days/week as specified in the permit conditions. Therefore, the operating schedule is **less than 12 hours/day**.

Step 5: Identify the Appropriate Meteorological Station

The facility is located in Azusa and according to Figure 1 in Attachment M, the closest monitoring station is **Azusa**.

Step 6: Identify Type of Receptor and Distance from Receptor

There are two identified receptor types **– a worker receptor located 100 meters** away and a **residential receptor located 500 meters** away.

Step 7: Select χ/Q Value

Since the volume source of 2,800 ft^2 and height of 17 feet operates less than 12 hours/day, the χ/Q values from Table 4.1 for Azusa at a distance of 100 meters (**1.15**) and 500 meters (**0.06**) were used.

Step 8: Identify MWAF

The MWAF values for all TACs were found in Table 8.1.

Step 9: Identify CP and REL

The CP values and chronic REL values for all TACs were found in Table 8.1.

Step 10: Identify MP

The MP values for all TACs were found in Table 8.1.

Step 11: Select CEF

The CEF values (**CEF_R = 676.63, CEF_W = 56.26**) for residential and worker exposures were found in Tables 9.1 & 9.2.

Step 12: Calculate WAF

Since the volume source operates 8 hours/day and 5 days/week, the WAF value (**4.2**) was found in Table 10.2.

MICR Calculation

(1) Worker: $\mathbf{MICR_W = CP \times Q_{tpy} \times \chi/Q \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF}$

TAC	CP	Q_{tpy}	χ/Q	CEF_W	MP_w	WAF	MWAF	MICR
Arsenic	$1.20 \times 10^{+1}$	8.30E-06	1.15	56.26	4.52	4.2	1	1.22×10^{-7}
Benzene	1.00×10^{-1}	7.50E-03	1.15	56.26	1.00	4.2	1	2.04×10^{-7}
Dioxin	$1.30 \times 10^{+5}$	6.10E-10	1.15	56.26	7.58	4.2	1	1.63×10^{-7}
Nickel hydroxide	9.10×10^{-1}	2.30E-03	1.15	56.26	1.00	4.2	0.6332	3.60×10^{-7}
							TOTAL	$\mathbf{8.50 \times 10^{-7}}$

(2) Resident: $\mathbf{MICR_R = CP \times Q_{tpy} \times \chi/Q \times CEF_R \times MP_R \times 10^{-6} \times MWAF}$

TAC	CP	Q_{tpy}	χ/Q	CEF_R	MP_R	MWAF	MICR
Arsenic	$1.20 \times 10^{+1}$	8.30E-06	0.06	676.63	9.71	1	3.93×10^{-8}
Benzene	1.00×10^{-1}	7.50E-03	0.06	676.63	1.00	1	3.04×10^{-8}
Dioxin	$1.30 \times 10^{+5}$	6.10E-10	0.06	676.63	25.72	1	8.28×10^{-8}
Nickel hydroxide	9.10×10^{-1}	2.30E-03	0.06	676.63	1.00	0.6332	5.38×10^{-8}
						TOTAL	$\mathbf{2.06 \times 10^{-7}}$

Please note that the higher of the worker and residential cancer risks needs to be selected. This value will be entered in MICR field in the NSR, 1401 section. In this example, the maximum cancer risk is at the worker receptor.

Cancer Burden Calculation

Cancer burden should always be calculated if the MICR exceeds one in a million, regardless of the type of receptor. For this example, cancer burden was not calculated because neither worker nor residential risk exceeded one in a million.

Hazard Index Calculations

Chronic, 8-hour and acute hazard indices should be calculated for each target organ.

Chronic Hazard Index:

Worker: $\mathbf{HIC_W = \Sigma\,[(Q_{tpy})\ x\ (\chi/Q)_{chronic}\ x\ MP_W\ x\ MWAF]/(Chronic\ REL)}$

Resident: $\mathbf{HIC_R = \Sigma\,[(Q_{tpy})\ x\ (\chi/Q)_{chronic}\ x\ MP_R\ x\ MWAF]/(Chronic\ REL)}$

Based on Table 11.1, the target organs for the TACs for chronic toxicity have been listed in Table C. The Chronic Hazard Index for the TACs in this example are calculated as follows:

Arsenic: HIC_W = [8.30E-06 x 1.15 x 28.37 x 1] / (1.50E-02) = **1.8E-02**

HIC_R = [8.30E-06 x 0.06 x 88.03 x 1] / (1.50E-02) **= 2.9E-03**

Benzene: HIC_W = [7.50E-03 x 1.15 x 1.00 x 1] / (3.00E+00) = **2.9E-03**

HIC_R = [7.50E-03 x 0.06 x 1.00 x 1] / (3.00E+00) **= 1.5E-04**

Dioxin: HIC_W = [6.10E-10 x 1.15 x 307.60 x 1] / (4.00E-05) = **1.2E-04**

HIC_R = [6.10E-10 x 0.06 x 6.73 x 1] / (4.00E-05) **= 2.8E-04**

Nickel hydroxide: HIC_W = [2.30E-03 x 1.15 x 1.00 x 0.6332] / (1.40E-02) = **1.2E-01**

HIC_R = [2.30E-03 x 0.06 x 1.00 x 0.6332] / (1.40E-02) **= 6.2E-03**

(1) Worker: HIC_W (summed across each target organ)

TAC	**AL**	**BN**	**CV**	**DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**REP**	**RESP**	**SKIN**
Arsenic			1.8E-2	1.8E-2						1.8E-2	1.8E-2	1.8E-2	1.8E-2
Benzene							2.9E-3						
Dioxin	1.2E-4			1.2E-4	1.2E-4		1.2E-4				1.2E-4	1.2E-4	
Nickel hydroxide				1.2E-1			1.2E-1				1.2E-1	1.2E-1	
TOTAL	1.2E-4		1.8E-2	**1.4E-1**	1.2E-4		1.2E-1			1.8E-2	**1.4E-1**	**1.4E-1**	1.8E-2

(2) Resident: HIC_R (summed across each target organ)

TAC	**AL**	**BN**	**CV**	**DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**REP**	**RESP**	**SKIN**
Arsenic			2.9E-3	2.9E-3						2.9E-3	2.9E-3	2.9E-3	2.9E-3
Benzene							1.5E-4						
Dioxin	2.8E-4			2.8E-4	2.8E-4		2.8E-4				2.8E-4	2.8E-4	
Nickel hydroxide				6.2E-3			6.2E-3				6.2E-3	6.2E-3	
TOTAL	2.8E-4		2.9E-3	**9.4E-3**	2.8E-4		6.6E-3			2.9E-3	**9.4E-3**	**9.4E-3**	2.9E-3

8-Hour Chronic Hazard Index:

Worker: $HIC8_W = \Sigma [(Q_{tpy}) \times (\chi/Q)_{chronic} \times WAF]/(\text{8-hour Chronic REL})$

Resident: $HIC8_R = \Sigma [(Q_{tpy}) \times (\chi/Q)_{chronic} \times WAF]/(\text{8-hour Chronic REL})$

Based on Table 11.3, the target organs for the TACs with chronic RELs have been listed in Table D. The 8-hour chronic hazard indices for the TACs in this example are calculated as follows:

Arsenic:

$HIC8_W$ = [8.30E-06 x 1.15 x 4.2 x 1] / (1.50E-02) = **2.7E-03**

$HIC8_R$ = [8.30E-06 x 0.06 x 1.0 x 1] / (1.50E-02) **= 3.3E-05**

Benzene:

$HIC8_W$ = [7.50E-03 x 1.15 x 4.2 x 1] / (3.00E+00) = **1.2E-02**

$HIC8_R$ = [7.50E-03 x 0.06 x 1.0 x 1] / (3.00E+00) **= 1.5E-04**

Dioxin: **There are no 8-hour chronic REL values established for dioxin.**

Nickel hydroxide:

$HIC8_W$ = [2.30E-03 x 1.15 x 4.2 x 0.6332] / (6.00E-02) = **1.2E-01**

$HIC8_R$ = [2.30E-03 x 0.06 x 1.0 x 0.6332] / (6.00E-02) **= 1.5E-03**

(1) Worker: $HIC8_W$ (summed across each target organ)

TAC	**AL**	**BN**	**CV**	**DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**REP**	**RESP**	**SKIN**
Arsenic			2.7E-3	2.7E-3						2.7E-3	2.7E-3	2.7E-3	2.7E-3
Benzene							1.2E-2						
Dioxin													
Nickel hydroxide								1.2E-1				1.2E-1	
TOTAL			2.7E-3	2.7E-3			1.2E-2	**1.2E-1**		2.7E-3	2.7E-3	**1.2E-1**	2.7E-3

(2) Resident: $HIC8_R$ (summed across each target organ)

TAC	**AL**	**BN**	**CV**	**DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**REP**	**RESP**	**SKIN**
Arsenic			3.3E-5	3.3E-5						3.3E-5	3.3E-5	3.3E-5	3.3E-5
Benzene							1.5E-4						
Dioxin													
Nickel hydroxide								1.5E-3				1.5E-3	
TOTAL			3.3E-5	3.3E-5			1.5E-4	**1.5E-3**		3.3E-5	3.3E-5	**1.5E-3**	3.3E-5

Acute Hazard Index:

For all acute compounds with RELs developed over 1 hour average, the acute hazard indices are estimated using the equation below:

Worker & Resident: $\mathbf{HIA= [Q_{lbph} \times (\chi/Q)_{hr}]/(Acute\ REL)}$

Based on Table 11.2, the target organs for the TACs have been listed in Table E. The χ/Q values were taken from Table 7. Since the

Note: The χ/Q values in Table 7 are based upon the maximum hourly emission rates.

Arsenic: HIA_W = [8.30E-06 x 107.4 x 1] / (2.00E-01) = **4.5E-03**

HIA_R = [8.30E-06 x 10.44 x 1] / (2.00E-01) **= 4.3E-04**

Benzene: HIA_W = [7.50E-03 x 107.4 x 1] / (2.70E+01) = **3.0E-02**

HIA_R = [7.50E-03 x 10.44 x 1] / (2.70E+01) **= 2.9E-03**

Dioxin: **There are no acute REL values established for dioxin.**

Nickel hydroxide: HIA_W = [2.30E-03 x 107.4 x 0.6332] / (2.00E-01) = **7.8E-01**

HIA_R = [2.30E-03 x 10.44 x 0.6332] / (2.00E-01) **= 7.6E-02**

(1) Worker: HIA_W (summed across each target organ)

TAC	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic			4.5E-3	4.5E-3						4.5E-3	4.5E-3		
Benzene				3.0E-2			3.0E-2	3.0E-2			3.0E-2		
Dioxin													
Nickel hydroxide								7.8E-1					
TOTAL			4.5E-3	3.5E-2			3.0E-2	**8.1E-1**		4.5E-3	3.5E-2		

(2) Resident: HIA_R (summed across each target organ)

TAC	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic			4.3E-4	4.3E-4						4.3E-4	4.3E-4		
Benzene				2.9E-3			2.9E-3	2.9E-3			2.9E-3		
Dioxin													
Nickel hydroxide								7.6E-2					
TOTAL			4.3E-4	3.3E-3			2.9E-3	**7.9E-2**		4.3E-4	3.3E-3		

Summary of Results

	MICR	HIC	HIC8	HIA
Worker	8.50×10^{-7}	1.4E-01	1.2E-01	8.1E-01
Resident	2.06×10^{-7}	9.4E-03	1.5E-03	7.9E-02
Rule 1401 Threshold	1×10^{-6}	1	1	1
Exceeds Threshold?	No	No	No	No

RESULT:

- ***MICRs for residential and commercial receptors do not exceed 1 x 10^{-6} (one in one million).***
- ***Calculation of cancer burden is not necessary.***
- ***HIC, HIC8, and HIA for residential and commercial receptors are less than 1 for all organ systems.***

The equipment in this example does not contain T-BACT; therefore, it would pass the Rule 1401 limits. A Tier 3 or 4 analysis is not necessary.

EXAMPLE 3: CONTEMPORANEOUS RISK REDUCTION

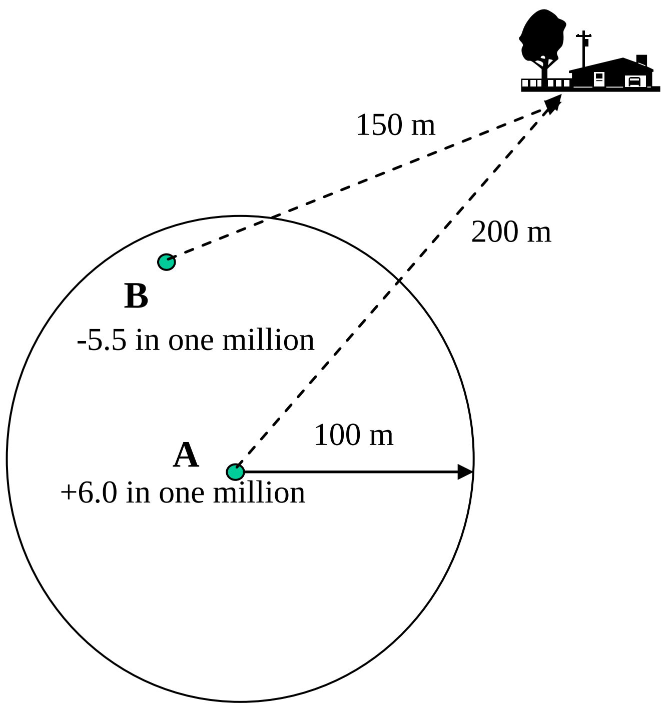
Rule 1401(g)(2)(A): The requirements of paragraph (d)(1) and (d)(4) shall not apply if the applicant demonstrates that a contemporaneous risk reduction resulting in a decrease in emissions will occur such that both of the following conditions are met:

(i) no receptor location will experience a total increase in MICR of greater than one in one million due to the cumulative impact of both the permit unit and the contemporaneous risk reduction, and

(ii) the contemporaneous risk reduction occurs within 100 meters of the permit unit.

T-BACT shall be used on permit units exempted under this subparagraph if the MICR from the permit unit exceeds one in one million (1 x 10^{-6}).

Note: All permit applications associated with the increases and decreases in risk for contemporaneous risk reduction must be submitted together and the reduction in risk must occur before the start of operation of the equipment that will have an increase in risk.



Assumptions:

Units A and B: Only have cancer impacts.

Unit A: New equipment, installed with T-BACT, MICR = 6.0 in one million

Unit B: Existing equipment with decreased MICR of 5.5 in one million due to change in operating conditions or process. Unit B emissions, prior to modification, resulted in an 8 in a million risk for the nearest receptor. After modification, Unit B risk is 2.5 in a million which is a decrease of 5.5 in a million.

Receptor R1: The increased risk for Receptor R1 is the MICR for Unit A less the decrease in risk for Unit B.

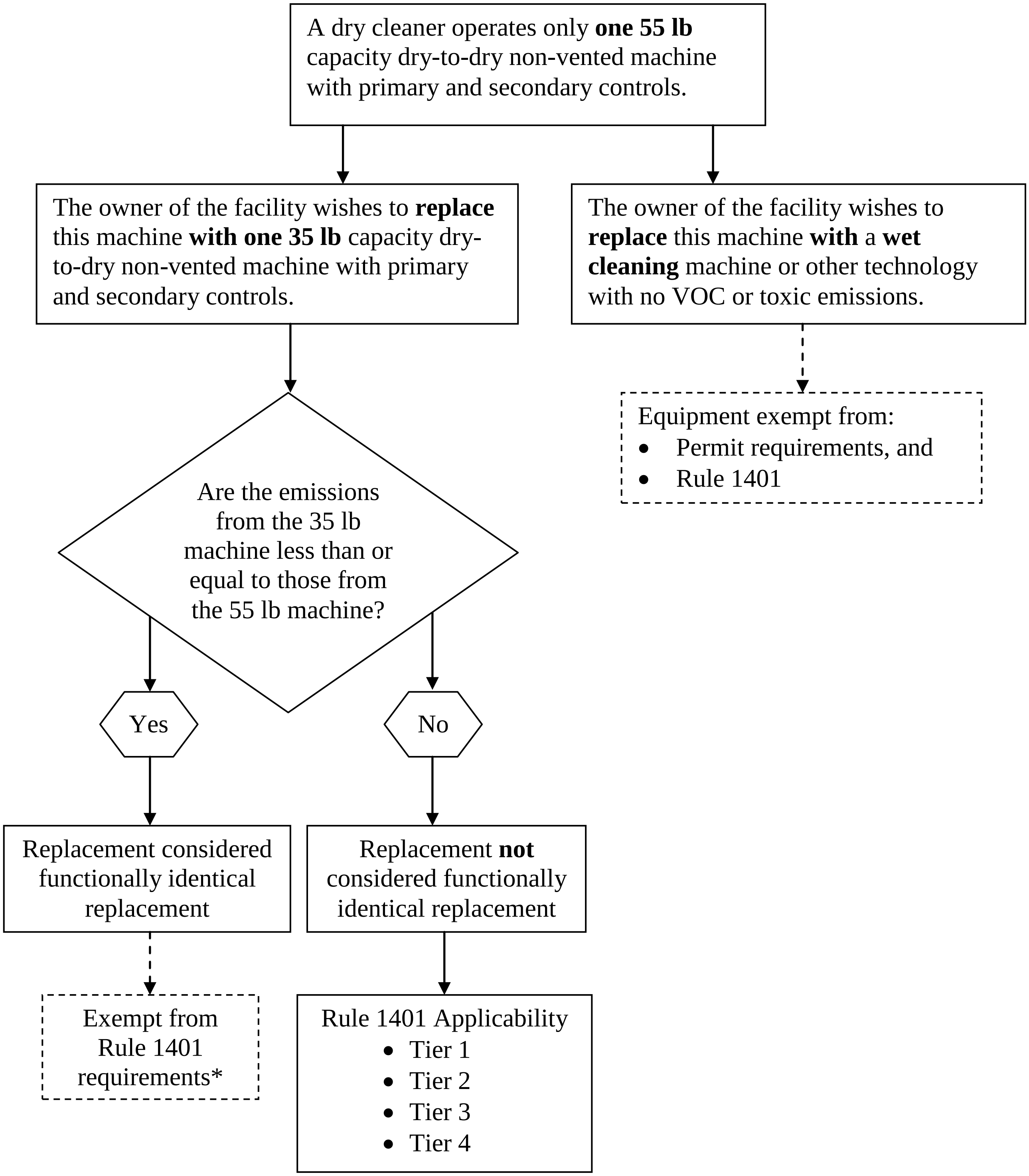
6.0 – 5.5 = **0.5 in one million**.

Note: This demonstaration is best achieved with a Tier 4 analysis (detailed air dispersion modeling) and must be performed for all possible receptors.

RESULT:

- ***Equipment was installed using T-BACT.***
- ***No receptor experiences an increase in risk greater than one in** one **million.***
- ***The contemporaneous risk reduction occurs within 100 meters of the new equipment.***
- ***If all other rule requirements are met, a permit would be issued.***

EXAMPLE 4: FUNCTIONALLY IDENTICAL EQUIPMENT REPLACEMENT



* Rule 1421(d)(1)(F) allows for the functionally identical equipment replacement of **only one** machine. Please note that all perchloroethylene machines must comply with Rule 1402 as well. As of December 31, 2020, no new or existing dry cleaning facility may use a perchloroethylene dry cleaning system.

BEST AVAILABLE CONTROL TECHNOLOGY FOR TOXICS

Best Available Control Technology for Toxics (T-BACT) is not required if the MICR is less than or equal to one in one million. If cancer risk is greater than one in a million, T-BACT is required and must reduce risk to less than or equal to 10 in a million.

SIC Codes, which describe industry types or classifications, or SCC Codes, which describe emitting processes or equipment, can be used to help identify T-BACT. If no standard is available, SCAQMD staff works with the applicant to identify T-BACT when required.

SCAQMD staff is continually examining and updating control technologies that comply with the definition presented in Rule 1401(c)(2). However, in many situations T-BACT is equivalent to BACT. The applicant is encouraged to contact the SCAQMD permit processing division for current T-BACT information.

T-BACT EXAMPLES

Type of Industry:	*Wood Finishing*
Type of Emitting Process:	***Wood Coatings***
Specific TAC Emissions:	***Ethyl Benzene,***
	Formaldehyde
Applicable BACT:	*Thermal Oxidizer*
T-BACT:	*Thermal Oxidizer*

BACT = T-BACT

With T-BACT, risk is 10 in one million or less

T-BACT is acceptable

Type of Industry:	*Metal Plating*
Type of Emitting Process:	***Nickel Plating, Chromium Plating***
Specific TAC Emissions:	***Nickel, Hexavalent Chromium***
Applicable BACT:	*Wet Scrubber*
T-BACT:	*HEPA*

With T-BACT, risk is 10 in one million or less

T-BACT is acceptable

APPENDIX I

Calculation Worksheets

Maximum Individual Cancer Risk (MICR) Calculation Worksheet
Acute Hazard Index (HIA) Calculation Worksheet
Chronic Hazard Index (HIC) Calculation Worksheet
8-Hour Chronic Hazard Index (HIC8) Calculation Worksheet

Maximum Individual Cancer Risk (MICR) CALCULATION WORKSHEET

Facility Name: ____________________

Facility Address: ____________________

Description of Equipment: ____________________

Equipment is (circle one): **Point Source** or **Volume Source**

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q_{lbpy} (lb/yr)	Maximum Annual Emissions, Q_{tpy} (ton/yr)	CP (Table 8.1)	MICR MP (Table 8.1)	
				Resident	Worker
1.					
2.					
3.					

Equipment operates (circle one) ≤ **12 hr/day** or > **12 hr/day**

If equipment is a **point source**, enter **Stack Height:** _________ ft

If equipment is a **volume source**, enter **Building Height:** ______ ft & **Floor Area:** ______ ft^2

Distance **to nearest residential or sensitive receptor:**_______ m &

Off-site worker receptor: ______ m

Nearest **SCAQMD meteorological station:** __________________ (Tables 12.1 & 12.2 & Fig 1 & 2)

Select **χ/Q** and **WAF Tables** as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Tables 2.1, 2.2, 2.2, 10.1	Tables 4.1, 4.2, 4.3, 4.4, 4.6, 4.6, 10.1
> 12 hr/day	Tables 3.1, 3.2, 3.3, 10.2	Tables 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 10.2

Select **CP** and **MP** from Table 8.1

χ/Q value for nearest residential/sensitive receptor: ________
for nearest off-site worker receptor: ________

WAF value for nearest residential/sensitive receptor: 1.0
for nearest off-site worker receptor: ______

CEF value for nearest residential/sensitive receptor: 676.63
for nearest off-site worker receptor: 56.2

MICR CALCULATION

TACs	CP	Q_{tpy}	χ/Q	CEF	MP	WAF	10^{-6}	MWAF	MICR
1.		x	x	x	x	x	x 10^{-6}	x	=
2.		x	x	x	x	x	x 10^{-6}	x	=
3.		x	x	x	x	x	x 10^{-6}	x	=
4.		x	x	x	x	x	x 10^{-6}	x	=

MICR =______________________

Chronic Hazard Index (HIC) CALCULATION WORKSHEET
Target Organ/System*: (Table 11.1)

Facility Name: ______________________________
Facility Address: ______________________________
Description of Equipment: ______________________________
Equipment operates (circle one) **≤ 12 hr/day** or **> 12 hr/day**
Equipment is (circle one): **Point Source** or **Volume Source**
If equipment is a **point source**, enter:
Stack Height: ___________ ft
If equipment is a **volume source**, enter
Building Height: ___________ ft & **Floor Area**: _________ ft^2
Distance **to nearest residential or sensitive receptor:** _____________ meters
Distance to **nearest off-site worker receptor**: _____________ meters
Nearest **SCAQMD meteorological station:** ___________________ (Tables 12.1 & 12.2 & Fig 1 & 2)
Select **χ/Q** as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Tables 2.1, 2.2, 2.2	Tables 4.1, 4.2, 4.3, 4.4, 4.6, 4.6
> 12 hr/day	Tables 3.1, 3.2, 3.3	Tables 5.1, 5.2, 5.3, 5.4, 5.5, 5.6

Select **Chronic REL** and **Chronic MP** from Table 8.1

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q_{lbpy} (lb/yr)	Maximum Annual Emissions, Q_{tpy} (ton/yr)	Dispersion Factor (χ/Q)	Chronic Reference Exposure Level (REL)	Chronic Multi-pathway Factor (MP)
1.					
2.					
3.					
2.					
3.					

CHRONIC HAZARD INDEX (HIC) CALCULATION:

Σ [(Q_{tpy}) x (χ/Q) x MP] / (Chronic REL) for each TAC

TACs	Q_{tpy}		χ/Q		MP		REL		HIC
1.		**x**		**x**		/		=	
2.		**x**		**x**		/		=	
3.		**x**		**x**		/		=	

* A worksheet needs to be filled out for each affected target organ/system.

8-Hour Chronic Hazard Index (HIC8) CALCULATION WORKSHEET

Target Organ/System*:__________________ (Table 11.3)

Facility Name: ____

Facility Address: ____

Description of Equipment: ____

Equipment operates (circle one) **≤ 12 hr/day** or **> 12 hr/day**

Equipment is (circle one): **Point Source** or **Volume Source**

If equipment is a **point source**, enter:

Stack Height: ___________ ft

If equipment is a **volume source**, enter

Building Height: ___________ ft & **Floor Area**: _________ ft^2

Distance **to nearest residential or sensitive receptor:** ____________ meters

Distance to **nearest off-site worker receptor**: ____________ meters

Nearest **SCAQMD meteorological station:** __________________ (Tables 12.1 & 12.2 & Fig 1 & 2)

	Point Source	Volume Source
≤ 12 hr/day	Tables 2.1, 2.2, 2.2, 10.1	Tables 4.1, 4.2, 4.3, 4.4, 4.6, 4.6, 10.1
> 12 hr/day	Tables 3.1, 3.2, 3.3, 10.2	Tables 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 10.2

Select **8-Hour Chronic REL** and **8-Hour Chronic MP from Table 8.1;** and **WAF from Table 10.2**

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q_{lbpy} (lb/yr)	Maximum Annual Emissions, Q_{tpy} (ton/yr)	Dispersion Factor (χ/Q)	Worker Adjustment Factor (WAF)	Chronic Reference Exposure Level (REL)
1.					
2.					
3.					

8-HOUR CHRONIC HAZARD INDEX (HIC8) CALCULATION:

Σ [(Q_{tpy}) x (χ/Q) x WAF] / (8-Hour Chronic REL) for each TAC

TAC	Q_{tpy}		χ/Q		WAF		REL		HIC8
1.		**x**		**x**		/		=	
2.		**x**		**x**		/		=	
3.		**x**		**x**		/		=	

* A worksheet needs to be filled out for each affected target organ/system.

Acute Hazard Index (HIA) CALCULATION WORKSHEET
Target Organ/System*: (Table 11.2)

Facility Name: ______________________________
Facility Address: ______________________________
Description of Equipment: ______________________________
Equipment is (circle one): **Point Source** or **Volume Source**
If equipment is a **point source**, enter:
Stack Height: ___________ ft
If equipment is a **volume source**, enter
Building Height: ___________ ft & **Floor Area**: _____________ ft^2
Distance **to nearest residential or sensitive receptor:** _____________ meters
Distance to **nearest off-site worker receptor**: _____________ meters
Nearest **SCAQMD meteorological station:** ___________________ (Tables 12.1 & 12.2 & Fig 1 & 2)
Select **χ/Q:** _____________
Select **χ/Q**: from Table 6.1 if Point Source or from Table 7.1 if Volume Source
Select **Acute REL** from Table 8.1

Toxic Air Contaminants Emitted by Equipment	Maximum Hourly Emissions, Q_{lbph} (lb/hr)	Peak Hourly Dispersion Factor χ/Q	Acute Reference Exposure Level (REL)
1.			
2.			
3.			

ACUTE HAZARD INDEX (HIA) CALCULATION:

$[Q_{lbph} \times (\chi/Q)]$ / (Acute REL)

TAC	Q_{lbph}		χ/Q		REL		HIA
1.		**x**		/		=	
2.		**x**		/		=	
3.		**x**		/		=	

* A worksheet needs to be filled out for each affected target organ/system.

APPENDIX II

Derivation of Tier 2 Multi-pathway Adjustment Factors (MP)

DERIVATION OF TIER 2 MULTI-PATHWAY ADJUSTMENT FACTORS (MP)

MULTI-PATHWAY FACTORS (MP)

Toxic air contaminants enter the body through a number of routes: inhalation; absorption through the skin; and ingestion from contaminated food, water, milk and soil. To account for uptake of toxics through routes of exposure other than inhalation, risk assessments often include a "multi-pathway" exposure analysis.

To simplify the screening risk assessment, multi-pathway adjustment (MP) factors were developed. The inhalation risk is multiplied by the MP factors to account for the additional health risk due to other pathways of exposure.

SCAQMD staff has previously developed multi-pathway factors in its risk assessment and screening procedures. For this update of the risk assessment procedures, the methodology has been updated and multi-pathway factors have been developed for additional compounds.

The MP factors were developed using the Risk Assessment Standalone Tool (RAST) build 15071, a computer software package that calculates risks based on ground level concentrations (GLC). Assumptions and parameters used to develop the MP factors are listed below:

Risk assessment options:

- Deposition velocity – 0.02 m/sec
- OEHHA default exposures are assumed for mother's milk, homegrown produce, and soil exposure
- A 'warm' climate, typical for Southern California is assumed for the dermal exposure pathway
- For noncancer chronic risk estimates, the "OEHHA Derived Method" risk analysis method is used. In this approach, the inhalation pathway is always considered a driving pathway, the next two dominant (driving) exposure pathways use the high-end point-estimates of exposure, while the remaining exposure pathways use mean point estimates.
- For residential cancer risk estimates, the "RMP (Derived) Method" risk analysis method is used. In this method, if inhalation is one of the top two dominant pathways, the method uses the breathing rate at 95th percentile of exposure for $\leq$ 2 years of age, and the breathing rate at the 80th percentile exposure for > 2 years of age. If inhalation is not the top two dominant pathways, it uses mean. For worker cancer risk, the "OEHHA Derived Method" risk analysis method is used.
- Pathways considered for residential exposure include inhalation, soil ingestion, dermal absorption, homegrown produce, and mother's milk.
- Pathways considered for worker exposure include inhalation, soil ingestion, and dermal absorption.

- The cancer risk estimates, including the Derived equations (both OEHHA and Adjusted), are based on 30-year exposures.
- The chronic multipathway factors (resident and worker) for the group listing of polychlorinated biphenyls (CAS number 57465-28-8) has been assigned those of its individual subspecies (243.908 and 10.82, respectively). (The group listing of PCBs does not include the Toxicity Equivalency Factors as developed by the World Health Organization 1997 and as adopted by the Office of Environmental Health Hazards Assessment in 2015.) PCB 126 (3,3',4,4',5-Pentachlorobiphenyl), CAS number 57465-28-8 was used in the calculation of the screening approach since it has the most stringent REL. In a case that a facility provides speciated PCB data, or other justification is available, different MP factor can be used subject to SCAQMD approval.

APPENDIX III

PROCEDURES FOR ADDRESSING NON-DETECTED COMPOUNDS AND BLANKS IN RISK ASSESSMENT

Procedures for Addressing Non-detected Toxic Air Contaminants and Blanks in Risk Assessment

INTRODUCTION

This appendix describes guidelines for estimating emissions of non-detected toxic air contaminants (TACs) and using blanks in emissions estimations for purposes of preparing health risk assessments for Rules 1401, 1402 and the Air Toxics "Hot Spots" program (AB 2588). Procedures are the same for preparing risk assessments for Rules 1401, 1402 and AB2588, however the lists of compounds are different. Rule 1401 uses only cancer potency factors (CPc) and reference exposure levels (RELs) approved by the Scientific Review Panel and prepared by the state Office of Environmental Health Hazard Assessment (OEHHA), whereas Rule 1402 and AB2588 use different sources for CPs and RELs, including draft numbers.

Under previous policy, the SCAQMD required that if a TAC could be present in emissions from a source but not detected during air testing, it must be assumed to be present below the limit of detection (LOD). This approach has been applied to stack testing, to measurements such as laboratory analysis of materials, and other monitoring and measurement methods. The concentration of non-detected TACs were to be reported as one-half (1/2) of the LOD.

Concerns were raised that this policy of carrying undetected TACs through a health risk assessment at half of the LOD could inflate risk estimates and might require facilities to install control equipment for emissions that may not be present. In addition, it would not be possible to detect the TAC after its emissions had been controlled and reduced.

Also, in the past, the SCAQMD did not allow any adjustments in the measured values of samples based on the results of reagent blanks. Concerns were raised that in certain cases the concentration of TACs measured in reagent blanks should be deducted from the actual measured samples.

To address these concerns, SCAQMD staff worked closely with affected facilities such as publicly owned treatment works (POTWs) and others during previous rulemaking efforts for Rules 1401 and 1402 to develop guidelines for addressing non-detected TACs and blanks in risk assessment.

OVERVIEW

The new approach begins with an initial level of screening to determine whether or not a TAC is likely to be present and therefore should be tested for. If the conditions in the screening guidelines are met, no further testing or analysis is required. If a TAC does not pass the screening guidelines, the facility must quantify and report the emissions of the compound through testing or other methods as approved by SCAQMD staff. The reported emission levels are calculated based on the number of test runs or analyses that are below the LOD.

SCREENING GUIDELINES

For a TAC to be excluded from testing or analysis and hence quantification for health risk assessment, it must meet either condition A, B, or C listed below.

Proof for exclusion of any TAC based on literature studies on physical nature or chemistry of the compounds to substantiate the findings, and any prior analysis or testing shall be deemed complete for SCAQMD approval. Any prior testing must have been conducted according to SCAQMD's approved test methods or other recognized standards, as approved by SCAQMD staff.

If a list of TACs to be tested for is agreed upon but is subsequently discovered by the facility or the SCAQMD that additional compounds may be present, SCAQMD staff may require that the facility test for the presence of the additional TACs.

The screening criteria to be used for determining the presence of TACs are the following.

Condition A: No likelihood of the presence of a TAC

A facility may choose to demonstrate that there is no likelihood of a TAC being present in the raw materials, process streams or materials introduced into the equipment or process. The methodology or documentation to show proof of the non-existence of the TAC must be deemed complete with the source test protocol or test method analysis protocol for SCAQMD approval. If the evidence to substantiate the absence of a TAC is insufficient, or SCAQMD staff has reason to believe that the TAC may be present, it must be tested for and quantified (see Cases 1, 2, and 3).

For example, a facility operator can demonstrate the absence of cadmium in emissions from the melting of lead ingots in a pot furnace by presenting the following documentation:

- Certified analysis of the lead ingots showing that cadmium is not a constituent of the ingot.
- Description of the process substantiating that no other material is added to the furnace that will contribute to cadmium emissions. The operator must also provide analysis for the fuel used in the process to demonstrate that it does not contain cadmium.
- Documentation substantiating that melting lead ingots without cadmium present in the ingot in a pot furnace will not result in the emissions of cadmium when the firebricks or pot liner are heated during the melting operations.

In addition, the facility operator may submit test results based on tests performed within the last two years, or a longer period if the facility can demonstrate that no significant changes have occurred to the SCAQMD-approved test method, process equipment or process materials, that indicate cadmium was reported as below LOD.

Condition B: Absence of a TAC or its precursors in the process

If there is any evidence that precursors, which could lead to formation of a TAC during a process or reaction, may be present, then a facility may have to test for the TAC. To be excluded from testing and quantification requirements, the facility must provide documentation to demonstrate, based on test results, that none of the essential precursors are present in the material or process. This is similar to the previous criteria and differs only in that precursor compounds that could contribute to the formation of the subject TAC must also be identified as not being present.

An example is emission of dioxins from a waste incinerator. In this case, test data may be available to show that there are no dioxins present in the waste stream being incinerated. However, the presence of chlorine and hydrocarbons in the combustion process could result in the formation of products of incomplete combustion (PICs) such as dioxins or other toxic compounds. Testing for these compounds would be required unless the facility operator demonstrates that none of the essential precursors are present in the waste stream or the process itself.

Condition C: Special TAC list for POTWs

Unlike other industrial sources whose potential toxic air emissions are relatively well defined and which contain limited species, proving the absence of TACs from emissions from POTWs is more difficult. This is because the instantaneous discharge of wastewater from various residential, commercial and industrial system users could potentially result in the presence of different toxic contaminants in the influent sewage. Therefore, it is recommended that a special TAC list be developed for POTWs to select appropriate TACs for testing and determination of health risk associated with air emissions from liquid phase and sludge treatment processes.

The special TAC list for POTWs will be approved by SCAQMD staff with consideration given to information including but not limited to the following:

1. The Pooled Emission Estimating Program (PEEP) identified and selected compounds under the AB 2588 emissions inventory program, as approved by SCAQMD staff.

2. The Joint Emissions Inventory Program (JEIP) identified and selected compounds under SCAQMD Rule 1179 inventory requirements, as approved by SCAQMD staff.

3. TACs that have a reasonable likelihood of being present in the air emissions of POTWs, based on other test results or information sources, as approved by SCAQMD staff.

Additionally, based on the specific sources of sewage for certain POTWs, specific TACs in addition to the ones identified through the above steps could be added or deleted from the list on a case-by-case basis.

Based on the special TAC list for POTWs as developed from the above procedure and subject to approval by SCAQMD staff, facilities will be required to quantify the listed compounds through testing or other methods approved by SCAQMD staff for inclusion in the health risk assessment. The facility will not have to test for compounds not included in the special TAC list for POTWs, and the inclusion of non-listed TACs in the health risk assessment is not required. However, if after the industry-specific list is developed and approved, the facility or the SCAQMD later discovers information that additional TACs may be present, SCAQMD staff may revise the industry-specific list and may require the facility to quantify emissions of such TACs that were previously excluded from quantification.

QUANTIFICATION OF EMISSIONS BASED ON SOURCE TEST RESULTS

The cases listed below explain the process for quantification of emissions based on the source test results.

Treatment of Test Runs Below LOD

If some test runs are below LOD, quantification of the TAC depends on the percent of the test runs and analyses that are below LOD. Three possible scenarios are discussed below. In all of these cases, all of the following three conditions must be met:

1. All tests should be performed using SCAQMD-approved test methods, triplicate sample runs and SCAQMD-approved detection limits. When non-detected values are reported, the actual analytical limit of detection for all runs and the number of sample runs shall be reported; and

2. The data from the analyses or tests were obtained within a period of two (2) years prior to the time the data is to be used by SCAQMD staff, unless the facility demonstrates to the SCAQMD's satisfaction that earlier test data remain valid due to lack of significant changes in test methods, process equipment or process materials; and

3. For cyclic operations or variations in feedstock, the tests or analyses conducted should be representative of the variations in loads, feed rates and seasons, if applicable. In such cases, an adequate number of test runs should be conducted for all cyclic or seasonal operations.

Case #1: TAC is not detected in any test runs or analyses

In situations in which all test runs and analyses consistently indicate levels below the LOD, the compound can be identified as "not detected" and its inclusion in the health risk assessment will not be required, provided all three conditions listed above are met.

Case #2: TAC is detected in less than 10% of the test runs or analyses

In situations in which a compound has been detected and the percentage of samples in which it is detected is less than ten percent, and provided that all three conditions listed above are met, the following procedure shall be used to average the results:

1. For those runs or analyses that were below LOD, assign zero.
2. Average the measured values obtained for the runs that were above LOD with zero values for the runs below LOD and report the final average result for use in the risk estimation.

Case #3: TAC is detected in 10% or more of the test runs or analyses

In cases in which ten or more percent of the test runs and analyses show measured values of a TAC above the LOD, and provided that all three condition listed above are met, the following procedure shall be used to average the results:

1. For those runs or analysis that were below LOD, assign one half (1/2) of the corresponding LOD for each run.
2. Average the measured values obtained for the runs that were above LOD with 1/2 LOD values for the runs below LOD and report the final average result for use in the risk estimation.

In cases in which there are fewer than ten samples (for example, two triplicate samples have been taken) and a TAC has been detected in one or more samples, the following procedures shall be used.

- If the TAC is detected in one sample, use Case #2.
- If the TAC is detected in two or more samples, use Case #3.

Use of Reagent Blanks

Reagent blank values may be subtracted from sample values under the conditions specified below. In order to use these procedures, it will be necessary to obtain from SCAQMD staff, prior to the test or analyses, a determination as to the maximum allowable value for the blank.

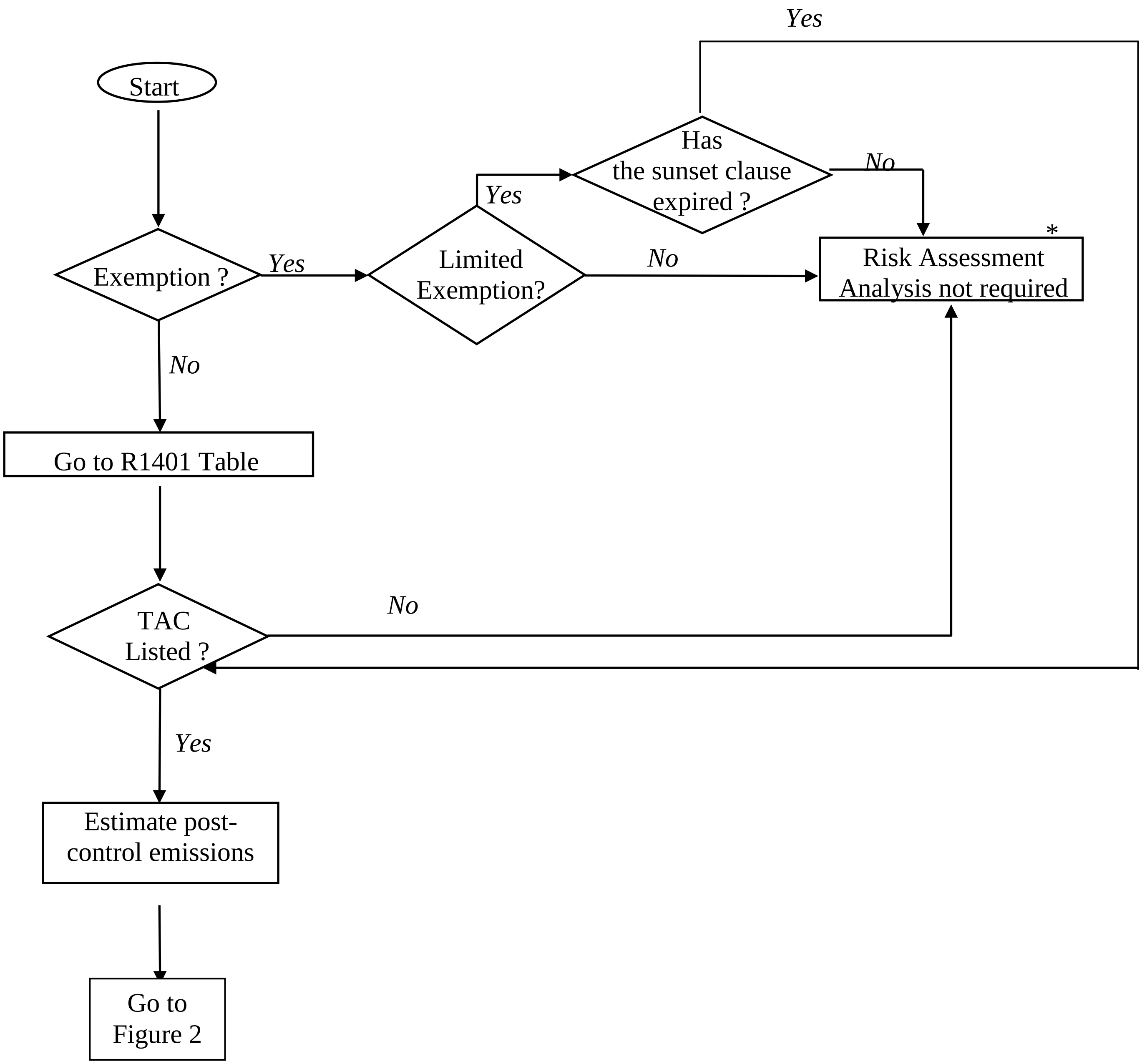
If the level of the TAC in the reagent blank is less than or equal to the maximum allowable blank, the reagent blank may be subtracted. The data must be reported with and without the correction. If the level of the TAC in the reagent blank is greater than the maximum allowable blank and the concentration of the sample is greater than 3 times the reagent blank value, then the maximum allowable reagent blank value can be subtracted. The data must be reported with and without correction.

APPENDIX IV

FLOW CHARTS AND DIAGRAMS

Note: The reader needs to ascertain the date in which the subject equipment's permit application was deemed complete. This date is used to identify the correct set of permitting tables (see Attachments) to be used for permit processing.

Figure 1
Preliminary Tasks



* Consult with SCAQMD staff for other TACs not listed in Table 1.1, which potentially endanger public health or may require a Rule 212 evaluation.

Figure 2
Tier 1 - Screening Levels

Tier 1 involves comparing emissions or source specific units from a piece of equipment to Screening Levels

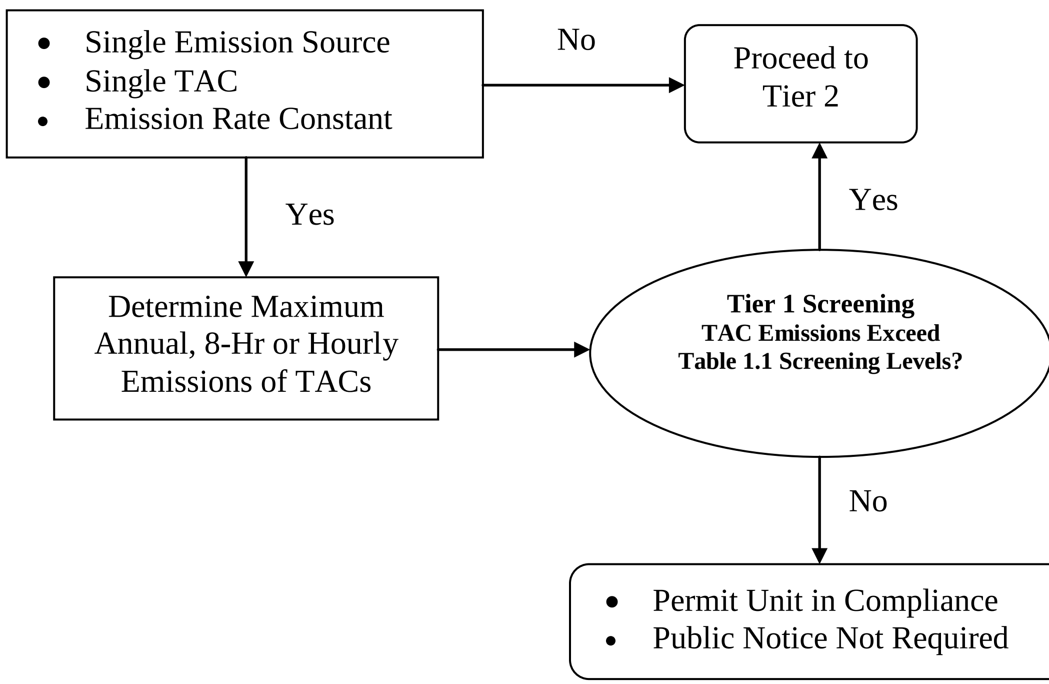
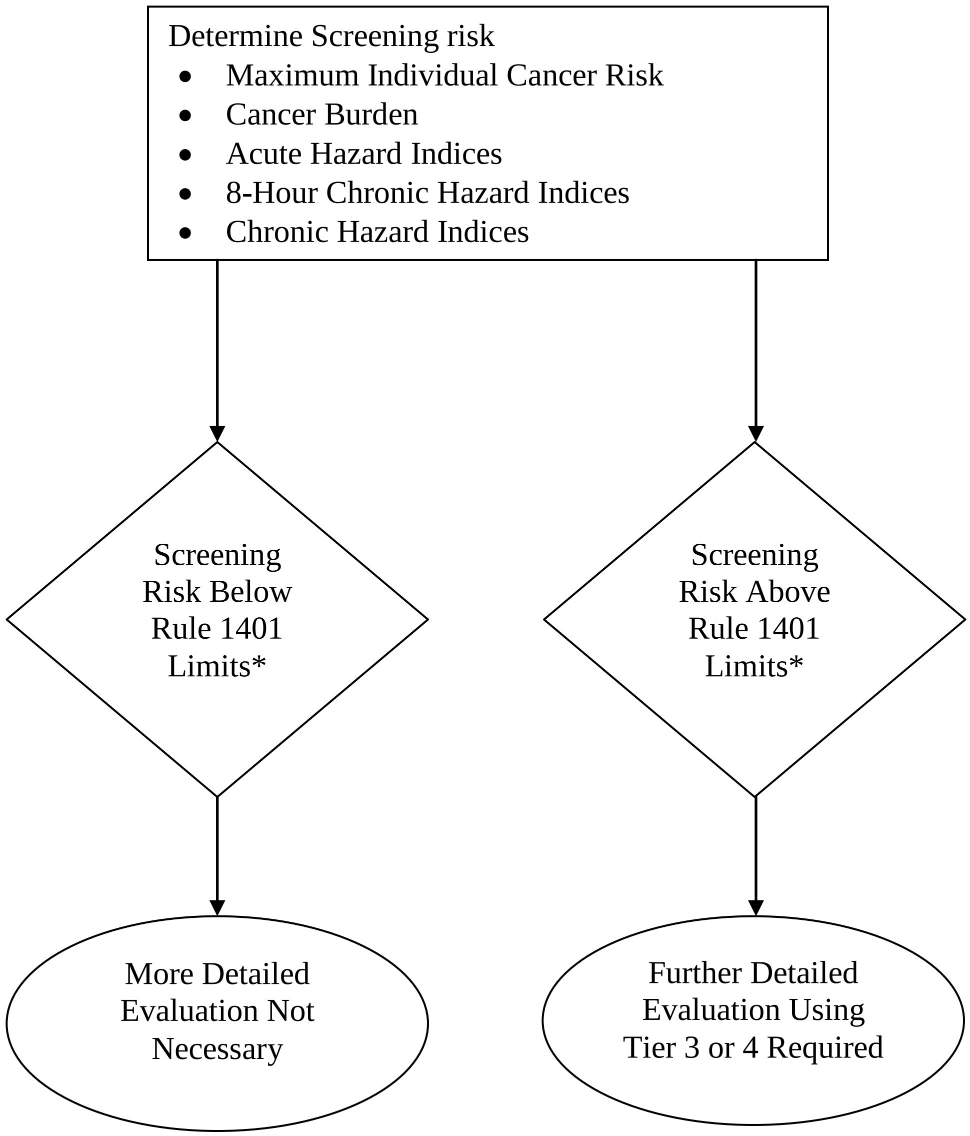


Figure 3A
Tier 2 - Screening Levels

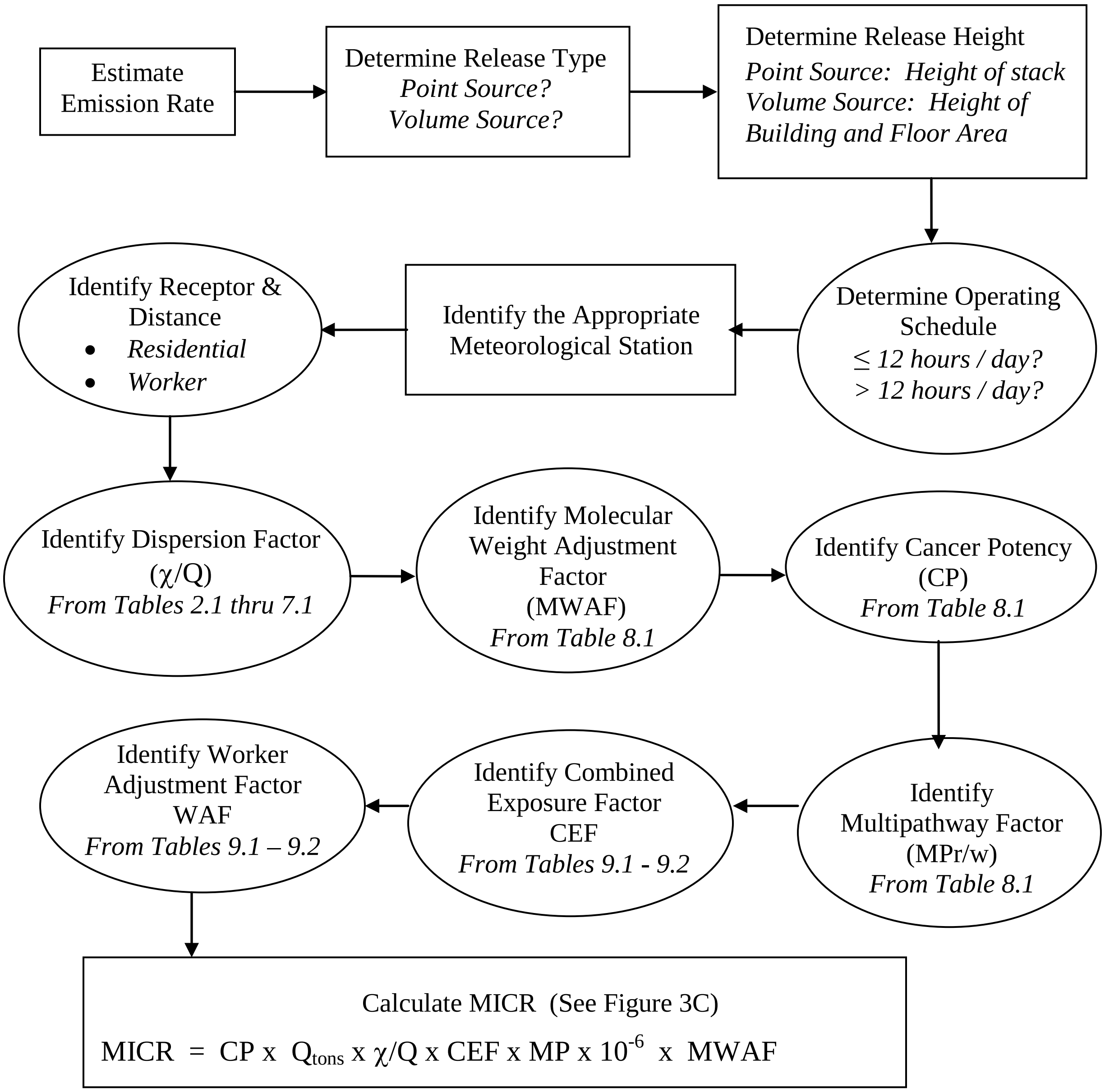
Tier 2 is a screening risk assessment, which includes procedures for determining level of risk from MICR, Cancer Burden, Acute, 8-Hour Chronic & Chronic Hazard Indices



* *Level of Concern:*

- *MICR exceeds one in one million with no T-BACT*
- *MICR exceeds 10 in one million with T-BACT*
- *Cancer burden exceeds 0.5*
- *HIA, HIC8 or HIC exceeds 1 for any target organ system*

Figure 3B
Tier 2 - Maximum Individual Cancer Risk (MICR) Calculation



If MICR exceeds one in one million, cancer burden must also be estimated.
(See Figure 4.)

Figure 3C
Tier 2 - Maximum Individual Cancer Risk (MICR) Equation

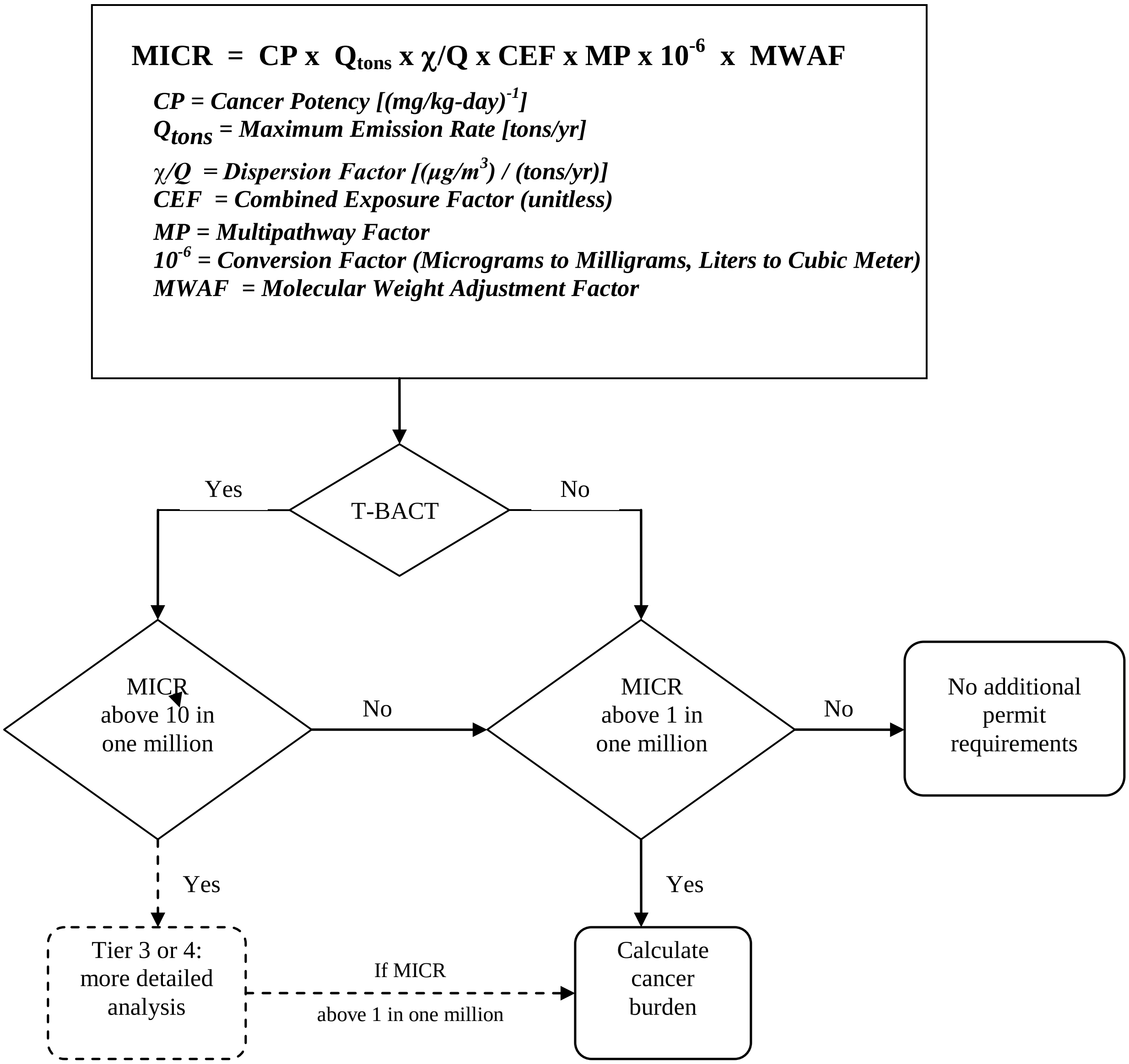


Figure 3D
Tier 2 - Dispersion Factor

Dispersion Factor (χ/Q): Numerical estimates of the amount of decrease in concentration of a contaminant as it travels away from the site of release.

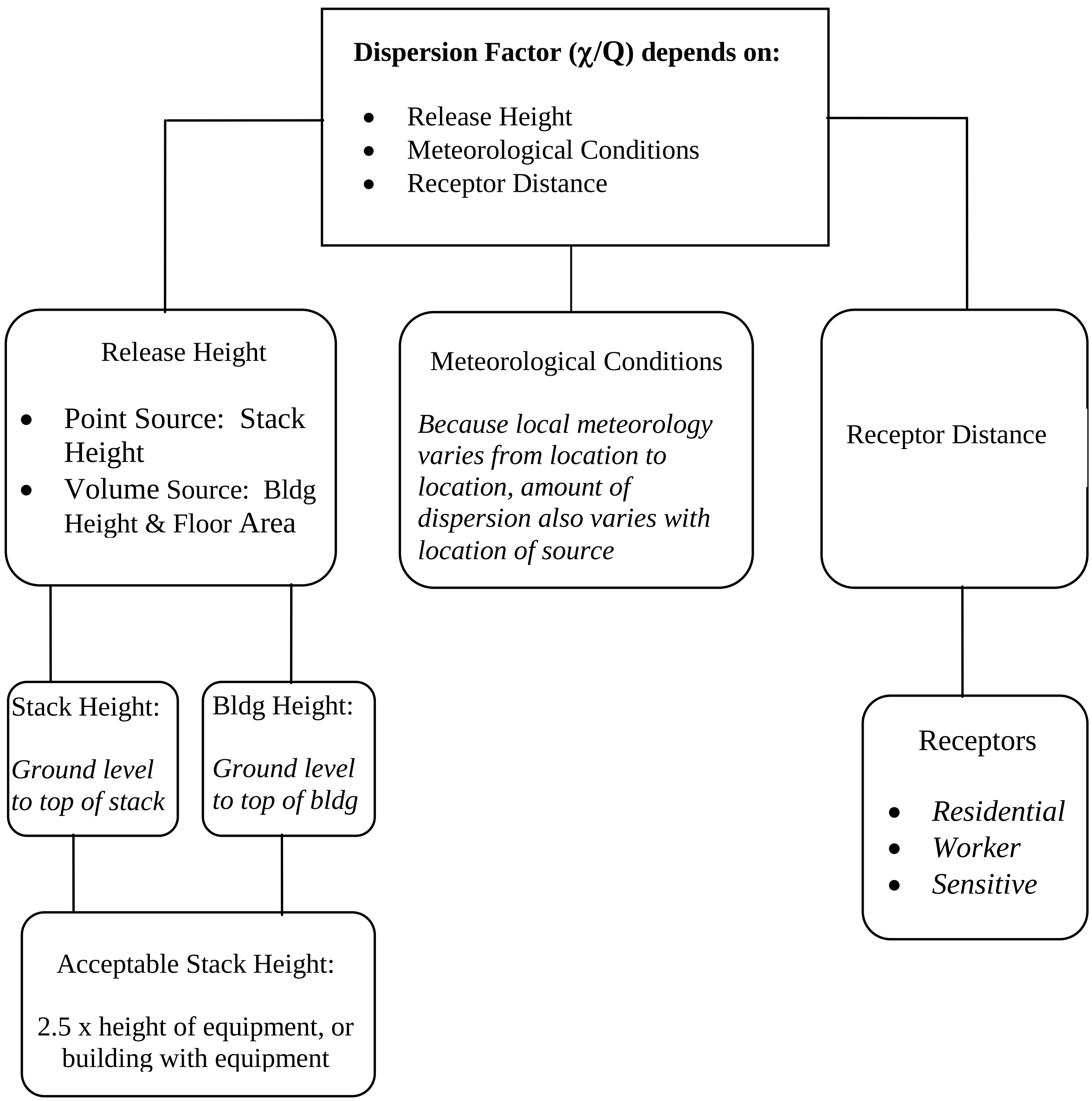


Figure 3E
Tier 2 - Multi-pathway Adjustment Factor

Multi-pathway Adjustment Factor (MP)

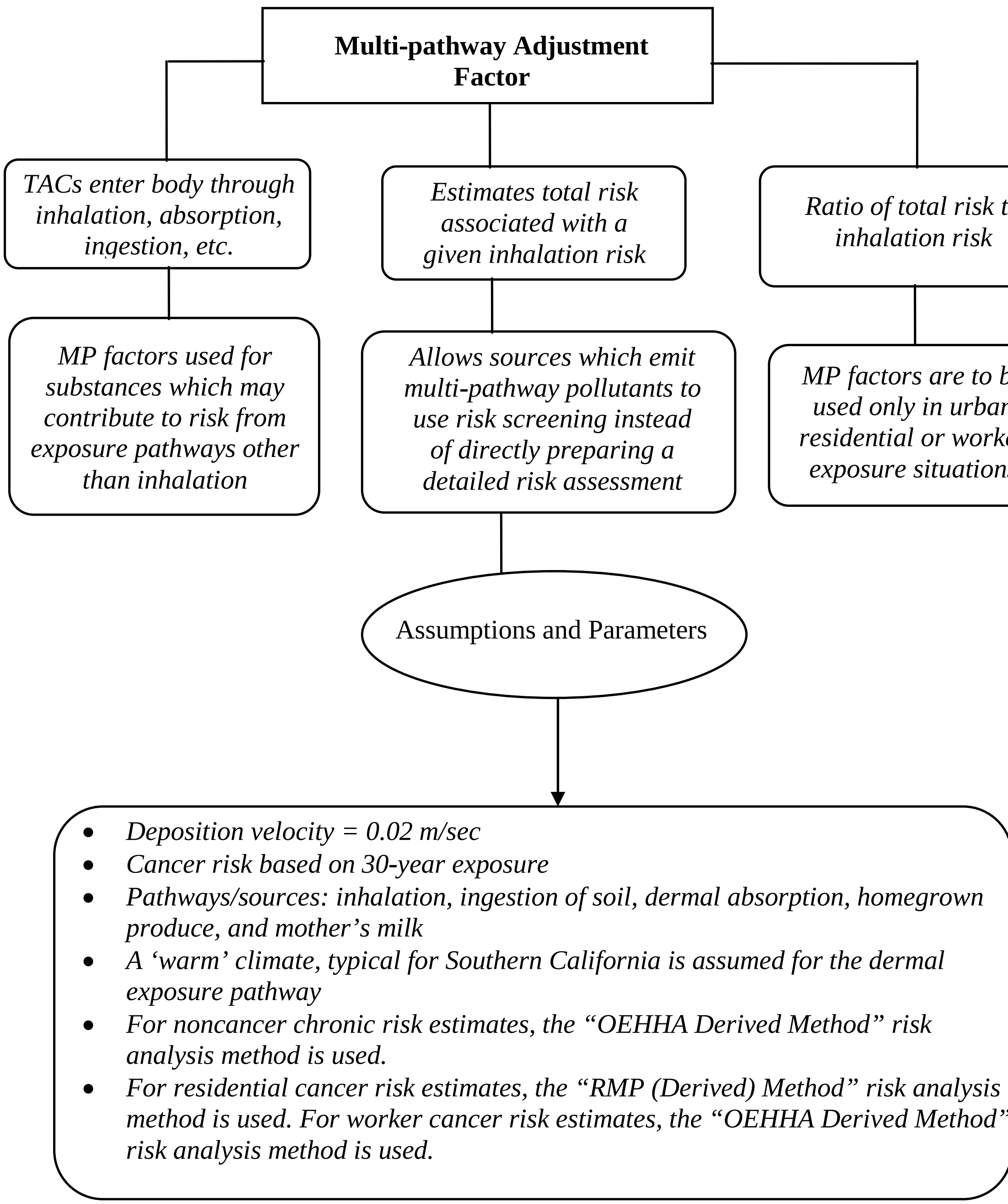


Figure 3F
Tier 2 - Combined Exposure Factor

Combined Exposure Factor (CEF)

CEF

Combines default exposure parameters for:

- Daily Breathing Rate (DBR)
- Age Sensitivity Factor (ASF)
- Exposure Duration (ED)
- Fraction of Time Spent at Home (FAH)
- Exposure Frequency (EF)
- Average Time (AT)

From Tables 9.1 and 9.2

Figure 4
Cancer Burden

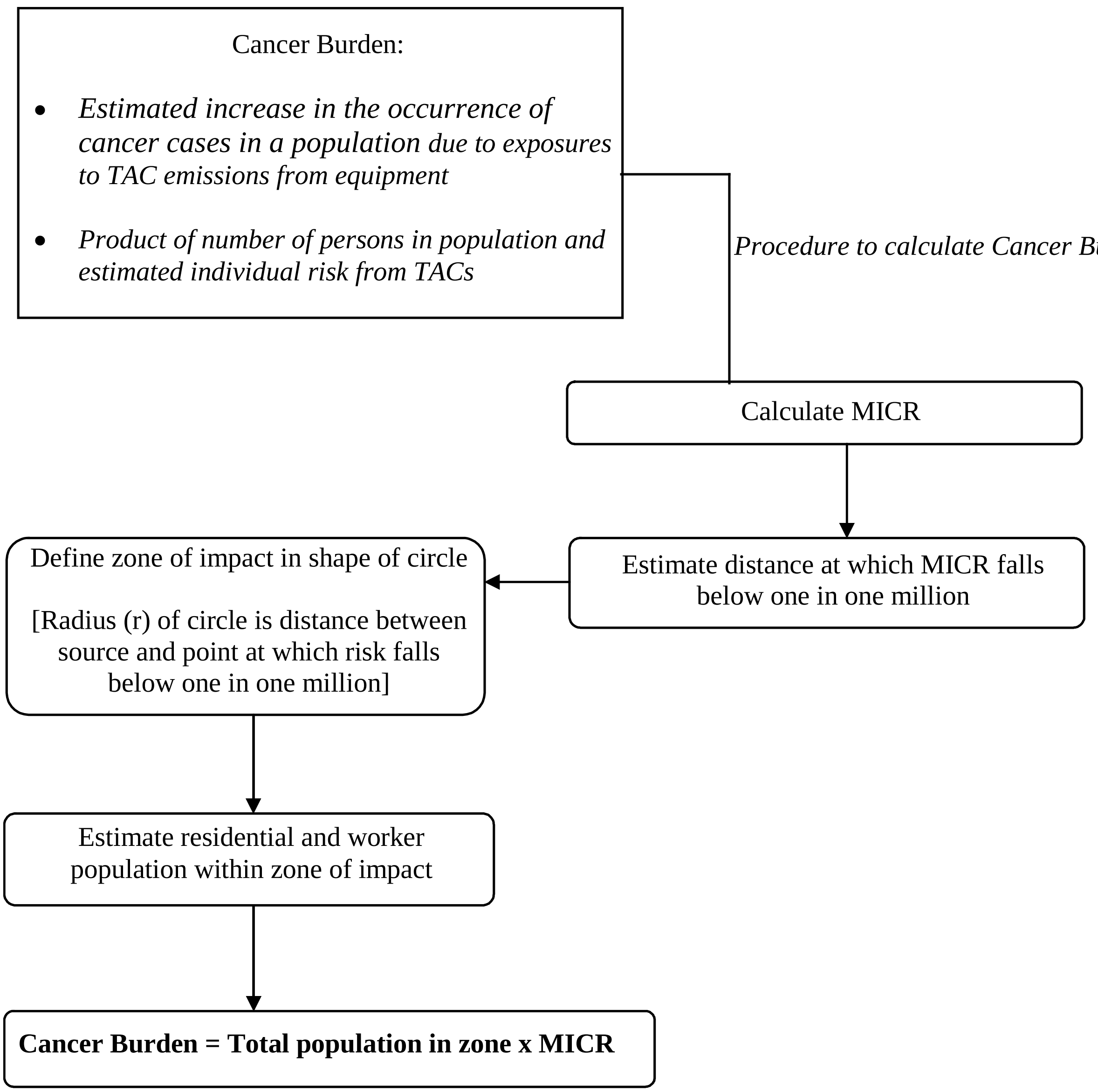


Figure 5
Chronic and 8-Hour Chronic Hazard Index (HIC and HIC8)

Chronic Hazard Index

↓

Determine Target Organs
Using Table 11.1

↓

Determine Q_{yr}
(Annual TAC emissions in tons)

↓

Select χ/Q
(Dispersion factor)
Using Tables 2.1 through 5.6

↓

Determine MP
(Multi-pathway adjustment factor)
Using Table 8.1

↓

Determine Chronic REL
Using Table 8.1

↓

Total Chronic Hazard Index (HIC)
for each target organ =
Σ [Q_{yr} x (χ/Q) x MP]/(Chronic REL)
for each TAC

8-Hour Chronic Hazard Index

↓

Determine Target Organs
Using Table 11.3

↓

Determine Q_{yr}
(Annual TAC emissions in tons)

↓

Select χ/Q
(Dispersion factor)
Using Tables 2.1 through 2.3,
Tables 4.1 through 4.6

↓

Determine MP
(Multi-pathway adjustment factor)
Using Table 8.1

↓

Determine 8-Hour Chronic REL
Using Table 8.1

↓

Total Chronic Hazard Index (HIC)
for each target organ =
Σ [Q_{yr} x (χ/Q) x WAF]/(Chronic REL)
for each TAC

Figure 6
Acute Hazard Index (HIA)

Acute Hazard Index

↓

Determine Target Organs
Using Table 11.2

↓

Determine Q_{hr}
(Maximum hourly emissions in lbs/hr)

↓

Select χ/Q_{max}
(Peak hourly dispersion factor)
Using Tables 6.1 or 7.1

↓

Determine Acute REL
Using Table 8.1

Reference Exposure Level (REL)
is a concentration level
(ug/m^3) or dose (mg/kg-day)
at which no adverse health
effects are anticipated

↓

Total Acute Hazard Index (HIA)
for each target organ =
$\Sigma\ [Q_{hr} \text{ x } (\chi/Q)_{max}]$ / (Acute REL)
for each TAC

APPENDIX V

RULE 1401 EXEMPTION PROVISIONS

Exemption Provisions

Rule 1401 (g)(1)(A): Permit Renewal or Change of Ownership

Any equipment which is in continuous operation, without modification or change in operating conditions, for which a new permit to operate is required solely because of permit renewal or change of ownership.

Rule 1401 (g)(1)(B): Modification with No Increase in Risk

A modification of a permit unit that causes a reduction or no increase in the cancer burden, MICR or acute or chronic HI at any receptor location.

Rule 1401 (g)(1)(C): Functionally Identical Replacement

A permit unit replacing a functionally identical permit unit, provided there is no increase in maximum rating or increase in emissions of any toxic air contaminants. For replacement of dry cleaning permit units only, provided there is no increase in any toxic air contaminants.

Rule 1401 (g)(1)(D): Equipment Previously Exempt Under Rule 219

Equipment which previously did not require a written permit pursuant to Rule 219 that is no longer exempt, provided that the equipment was installed prior to the Rule 219 amendment eliminating the exemption and a complete application for the permit is received within one (1) year after the Rule 219 amendment removing the exemption.

Rule 1401 (g)(1)(E): Modifications to Terminate Research Projects

Modifications restoring the previous permit conditions of a permit unit, provided that: the applicant demonstrates that the previous permit conditions were modified solely for the purpose of installing innovative control equipment as part of a demonstration or investigation designed to advance the state of the art with regard to controlling emissions of toxic air contaminants; the emission reductions achieved by the demonstration project are not used for permitting any equipment with emission increases under the contemporaneous emission reduction exemption as specified in paragraph (g)(2); the demonstration project is completed within two (2) years; and a complete application is submitted no later than two (2) years after the date of issuance of the permit which modified the conditions of the previous permit for the purpose of the demonstration or investigation.

Rule 1401 (g)(1)(F): Emergency Internal Combustion Engines

Emergency internal combustion engines that are exempted under Rule 1304.

Rule 1401 (g)(1)(G): Wood Product Stripping (Expired)

Wood product stripping permit units, provided that the risk increases due to emissions from the permit unit owned or operated by the applicant for which complete applications were submitted on or after July 10, 1998 will not exceed a MICR of 100 in one million (1.0 x 10^{-4}) or a total acute or chronic hazard index of five (5) at any receptor location. This exemption shall not apply to permit applications received after January 10, 2000, or sooner if the Executive Officer makes a determination that T-BACT is available to enable compliance with the requirements of paragraphs (d)(1), (d)(2) and (d)(3).

Rule 1401 (g)(1)(H): Gasoline Transfer and Dispensing Facilities (Expired)

For gasoline transfer and dispensing facilities, as defined in Rule 461 – Gasoline Transfer and Dispensing, the Executive Officer shall not, for the purposes of paragraphs (d)(1) through (d)(5), consider the risk contribution of methyl tert-butyl ether for any gasoline transfer and dispensing permit applications deemed complete on or before December 31, 2003. If the state of California extends the phase-out requirement for methyl tert-butyl ether as an oxygenate in gasoline, the limited time exemption shall be extended to that expiration date or December 31, 2004, whichever is sooner.

Rule 1401 (g)(2): Contemporaneous Risk Reduction

Simultaneous risk reduction such that an increase in MICR or HI from a equipment will be mitigated by a risk reduction from another equipment within 100 meters and the net impact on any receptor will be less than or equal to an increased MICR of 1 in 1 million or an HI of 1, provided that both applications for the increase and decrease are deemed complete together, the risk reduction occurs first, and the reduction is enforceable.

APPENDIX VI

TIER 2 SCREENING TABLES FOR NON-COMBUSTION SOURCES FOR USE IN RULE 1401

Introduction

The purpose of this report is to document the methods used by SCAQMD staff to estimate cancer risks from non-combustion sources. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD.

Emission Inventory Methods

In order to determine the appropriate emission rates to use, please contact the appropriate SCAQMD Engineering staff (http://www.aqmd.gov/contact/permitting-staff) for more information.

Exposure Modeling Methods

Air quality modeling was performed using AERMOD (American Meteorological Society/U.S. EPA Regulatory Model). As of December 9, 2006, U.S. EPA promulgated AERMOD as a replacement for ISCST3 (Industrial Source Complex – Short Term, Version 3) as the recommended dispersion model. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

AERMOD (version 14134) was executed using the urban option, which is SCAQMD policy for all permitting in its jurisdiction. The U.S. EPA regulatory default options, with the exception of the FLAT terrain option, were implemented and the SCAQMD AERMOD-ready meteorological data was used. The County populations used are based on the 2008 estimates from the U.S. Census Bureau. The Los Angeles County population was 9,862,049; Orange County population was 3,010,759; Riverside County population was 2,100,516; and San Bernardino County population was 2,015,355. SCAQMD's meteorological data is updated on a tri-annual basis and the population estimates will also be updated at that time.

For screening purposes, flat terrain was assumed. Although this is appropriate for most projects within the South Coast Air Basin, it is important to note that if complex terrain is present, the screening tables are not appropriate to be used and project-specific modeling using the elevated terrain option is recommended.

The non-combustion sources were modeled as either a point source or volume source with the parameters presented in Tables 1 and 2. Consistent with the modeling prepared for SCAQMD's risk assessment procedures for Rule 1401, building downwash effects were analyzed for point sources with a 20 meter by 30 meter building, 4 meters high.

Table 1: Stack Parameters for Point Sources

Source ID	Release Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
P1	4.27	0*	10	0.3
P2	7.62	0*	10	0.3
P3	15.24	0*	10	0.3

Note: * The temperature used in AERMOD was set to 0 K, which indicates that the ambient temperature was used in the model run.

Table 2: Stack Parameters for Volume Sources

Source ID	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
V1	2.29	2.84	2.13
V2	2.29	5.01	2.13
V3	4.57	5.01	4.25
V4	2.29	8.679	2.13
V5	4.57	8.679	4.25
V6	4.57	15.04	4.25

Modeling was performed at 27 SCAQMD meteorological stations shown in Figure 1. The locations of each of the sites are given in Table 3. The data are available on the SCAQMD website (http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod). A polar receptor grid is assumed at ten degree azimuth increments at the following downwind distances: 25, 50, 75, 100, 200, 300, 500, and 1,000 meters.

The peak model-predicted impacts at each downwind distance over the 36 azimuth angles for each meteorological station were used to develop the attached tables.

A sample AERMOD model input file is provided in Exhibit 1.

Figure 1: Meteorological Monitoring Stations in the South Coast Air Basin

Table 3: Locations of Meteorological Stations and Elevations

	UTM Coordinates (km)		Lat./Long. Coordinates		Elevation
Station name	Easting	Northing	Latitude	Longitude	(m)
Anaheim	413.14	3743.57	33:49:50	117:56:19	41
Azusa	414.81	3777.47	34:08:11	117:55:26	182
Banning	513.10	3753.19	33:55:15	116:51:30	660
Burbank	378.62	3782.24	34:10:33	118:19:01	175
Central LA	386.79	3770.00	34:03:59	118:13:36	87
Compton	388.59	3751.88	33:54:05	118:12:18	22
Costa Mesa	414.16	3726.19	33:40:26	117:55:33	20
Crestline	474.62	3788.76	34:14:29	117:16:32	1387
Fontana	454.62	3773.19	34:06:01	117:29:31	367
Indio	572.67	3729.90	33:42:30	116:12:57	-4
La Habra	411.98	3754.08	33:55:31	117:57:08	82
Lake Elsinore	469.33	3726.13	33:40:35	117:19:51	406
LAX	367.83	3757.80	33:57:15	118:25:49	42
Long Beach	389.99	3743.04	33:49:25	118:11:19	30
Lynwood	388.07	3754.73	33:55:44	118:12:39	29
Mission Viejo	437.39	3721.17	33:37:49	117:40:30	170
Palm Springs	542.46	3745.73	33:51:10	116:32:28	171
Perris	478.91	3738.58	33:47:20	117:13:40	442
Pico Rivera	401.31	3763.61	34:00:37	118:04:07	58
Pomona	430.78	3769.61	34:04:00	117:45:00	270
Redlands	486.36	3768.50	34:03:32	117:08:52	481
Reseda	358.76	3785.11	34:11:57	118:31:58	228
Riverside	461.64	3762.10	34:00:02	117:24:55	250
San Bernardino	474.76	3773.82	34:06:24	117:16:25	305
Santa Clarita	359.48	3805.52	34:23:00	118:31:42	375
Upland	441.96	3773.66	34:06:14	117:37:45	379
West LA	365.54	3768.52	34:03:02	118:27:24	97

Exhibit 1: AERMOD Model Input File for Non-Combustion Sources

```
CO STARTING
   TITLEONE R1401 Risk Assessment Procedures - Anah
   TITLETWO 8 hrs/day; 7 days/week; 52 weeks/yr
   MODELOPT CONC FLAT
   AVERTIME 1   PERIOD
   POLLUTID Any
   RUNORNOT RUN
   ERRORFIL ERRORS.OUT
   URBANOPT 3010759 OC
CO FINISHED

SO STARTING
   LOCATION P1 POINT     0.0    0.0    0.0
   LOCATION P2 POINT     0.0    0.0    0.0
   LOCATION P3 POINT     0.0    0.0    0.0

** Point Source      Q      RelHgt   Temp     Vel       Dia
**               ---------  ------  ------  ------    ------
   SRCPARAM P1     0.0865     4.27    0      10.0      0.3
   SRCPARAM P2     0.0865     7.62    0      10.0      0.3
   SRCPARAM P3     0.0865    15.24    0      10.0      0.3

SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDWID P1   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P1   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P1   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDWID P1   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P1   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P1   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDLEN P1   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P1   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P1   34.60   35.84   35.98   35.03   33.02   30.00
SO BUILDLEN P1   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P1   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P1   34.60   35.84   35.98   35.03   33.02   30.00
SO XBADJ    P1  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P1  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P1  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO XBADJ    P1  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P1  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P1  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00

SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDWID P2   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P2   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P2   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDWID P2   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P2   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P2   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDLEN P2   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P2   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P2   34.60   35.84   35.98   35.03   33.02   30.00
SO BUILDLEN P2   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P2   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P2   34.60   35.84   35.98   35.03   33.02   30.00
SO XBADJ    P2  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P2  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P2  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO XBADJ    P2  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P2  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
```

```
SO XBADJ    P2  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00

SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDWID P3   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P3   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P3   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDWID P3   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P3   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P3   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDLEN P3   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P3   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P3   34.60   35.84   35.98   35.03   33.02   30.00
SO BUILDLEN P3   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P3   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P3   34.60   35.84   35.98   35.03   33.02   30.00
SO XBADJ    P3  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P3  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P3  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO XBADJ    P3  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P3  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P3  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00

   URBANSRC P1
   URBANSRC P2
   URBANSRC P3

SO EMISFACT  P1-P3  HROFDY  8*0.0   8*1.0   8*0.0

   SRCGROUP  P1  P1
   SRCGROUP  P2  P2
   SRCGROUP  P3  P3

SO SRCGROUP  ALL

SO FINISHED

RE STARTING
   GRIDPOLR POL1 STA
                 ORIG     0.0     0.0
                 DIST  25 50 75 100 200 300 500 1000
                 GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED

ME STARTING
   SURFFILE anah8.sfc
   PROFFILE anah8.pfl
   SURFDATA 0 2006
   UAIRDATA 3190 2006
   PROFBASE 0.0 METERS
ME FINISHED

OU STARTING
   RECTABLE  1       FIRST
   RECTABLE  ALLAVE  FIRST
   PLOTFILE  1       P1  FIRST  AM1T1P1.TXT
   PLOTFILE  PERIOD  P1         AM1T2P1.TXT
   PLOTFILE  1       P2  FIRST  AM1T1P2.TXT
   PLOTFILE  PERIOD  P2         AM1T2P2.TXT
   PLOTFILE  1       P3  FIRST  AM1T1P3.TXT
   PLOTFILE  PERIOD  P3         AM1T2P3.TXT

OU FINISHED
```

Results

Figure 2 shows the source receptor areas (SRA) within the South Coast Air Basin and Table 4 lists the appropriate meteorological station to use for each SRA.

Figure 2: Source/Receptor Areas

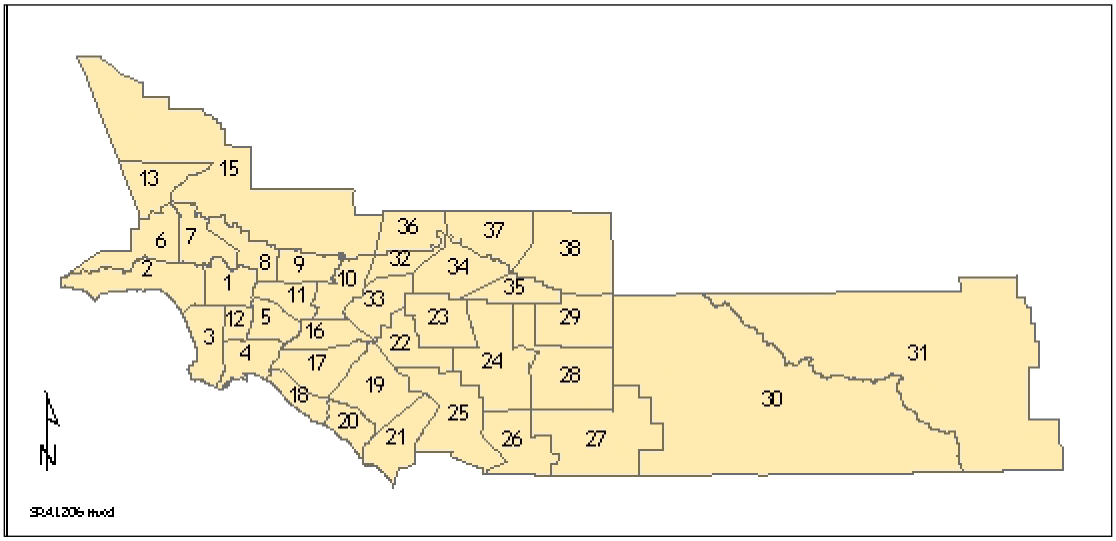


Table 4: Meteorological Stations for Each Source/Receptor Area.

Meteorological Station	Source/ Receptor Area	Meteorological Station	Source/ Receptor Area
Anaheim	17	Compton/Lynwood	12
Azusa	8, 9	Mission Viejo	19, 21
Banning	29	Perris	24, 28
Burbank	7	Palm Springs	30, 31
Central LA	1	Pico Rivera	5, 11
Crestline	37	Pomona	10
Costa Mesa	18, 20	Redlands	35, 38
Fontana	34	Reseda	6
Indio	30	Riverside	22, 23
La Habra	16	Santa Clarita	13, 15
Lake Elsinore	25, 26, 27	San Bernardino	34
LAX	3	Upland	32, 33, 36
Long Beach	4	West LA	2

The Tier 2 tables developed using this methodology are included in Permit Application Attachment "M" for the Risk Assessment Procedures for Rules 1401 & 212.

APPENDIX VII

TIER 2 SCREENING TABLES
FOR COMBUSTION SOURCES
(NATURAL GAS BOILERS, NATURAL GAS INTERNAL COMBUSTION ENGINES, DIESEL INTERNAL COMBUSTION ENGINES)
FOR USE IN RULE 1401

Introduction

The purpose of this report is to document the methods used by SCAQMD staff to estimate cancer risks from natural gas-fueled boilers, natural gas-fueled internal combustion engines (ICEs) and diesel-fueled ICEs. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD.

Emission Inventory Methods

In order to determine the appropriate/default emission rates to use for fuel combustion sources, please refer to "Supplemental Instructions, Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, Annual Emissions Reporting Program" (http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-ab2588-facilities.pdf) for more information.

Exposure Modeling Methods

Air quality modeling was performed using AERMOD (American Meteorological Society/U.S. EPA Regulatory Model). As of December 9, 2006, U.S. EPA promulgated AERMOD as a replacement for ISCST3 (Industrial Source Complex – Short Term, Version 3) as the recommended dispersion model. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

AERMOD (version 14134) was executed using the urban option, which is SCAQMD policy for all permitting in its jurisdiction. The U.S. EPA regulatory defaults options, with the exception of the FLAT terrain option, were implemented and the SCAQMD AERMOD-ready meteorological data was used. The County populations used are based on the 2008 estimates from the U.S. Census Bureau. The Los Angeles County population was 9,862,049; Orange County population was 3,010,759; Riverside County population was 2,100,516; and San Bernardino County population was 2,015,355. SCAQMD's meteorological data is updated on a tri-annual basis and the population estimates will also be updated at that time.

For screening purposes, flat terrain was assumed. Although this is appropriate for most projects within the South Coast Air Basin, it is important to note that if complex terrain is present, the screening tables are not appropriate to be used and project-specific modeling using the elevated terrain option is recommended.

Combustion source stacks were modeled as a point source with the stack parameters presented in Table 1. These parameters were based on the San Joaquin Valley Unified Air Pollution Control District's modeling parameters[1]. Consistent with the modeling prepared for SCAQMD's risk

[1] San Joaquin Valley Unified Air Pollution Control District, Draft Staff Report with Appendices for Proposed Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document,

assessment procedures for Rule 1401, building downwash effects were analyzed with a 20 meter by 30 meter building, 4 meters high.

Table 1: Stack Parameters by Combustion Source Type

Source ID	Equipment Rating	Release Height (m)	Stack Inside Diameter (m)	Gas Exit Temp. (K)	Gas Exit Velocity (m/s)	Gas Exit Flow Rate (m^3/min)
Gaseous Fuel Fired (Natural Gas) Boilers						
B1	0 – 4.9 MMBTU/hr	9.0	0.40	440	5	37.7
B2	5 – 9.9 MMBTU/hr	9.0	0.50	470	7	82.5
B3	10 – 19.9 MMBTU/hr	9.0	0.55	470	9	128.3
B4	20 – 29.9 MMBTU/hr	10.0	0.67	470	10	211.5
B5	30 – 49.9 MMBTU/hr	10.0	0.72	495	12	293.1
B6	50 – 149.9 MMBTU/hr	14.0	1.10	440	10	570.2
B7	150 – 200 MMBTU/hr	16.0	1.50	430	12	1,272.3
Natural Gas Reciprocating Internal Combustion Engines						
N1	50 – 74.9 BHP	4.0	0.07	850	40	9.2
N2	75 – 149.9 BHP	4.0	0.08	850	65	19.6
N3	150 – 249.9 BHP	4.0	0.14	890	55	50.8
N4	250 – 999.9 BHP	5.0	0.19	820	60	102.1
N5	> 1,000 BHP	7.0	0.35	750	65	375.2
Diesel Reciprocating Internal Combustion Engines						
D1	50 – 174.9 BHP	3.0	0.09	760	65	24.8
D2	175 – 299.9 BHP	3.0	0.12	760	55	37.3
D3	300 – 399.9 BHP	3.0	0.13	760	80	63.7
D4	400 – 599.9 BHP	3.0	0.15	770	90	95.4
D5	600 – 1,149.9 BHP	4.0	0.17	800	160	217.9

Modeling was performed at 27 SCAQMD meteorological stations shown in Figure 1. The locations of each of the sites are given in Table 2. The data are available on the SCAQMD website (http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod). A polar receptor grid is assumed at ten degree azimuth increments at the following downwind distances: 25, 50, 75, 100, 200, 300, 500, and 1,000 meters.

The peak model-predicted impacts at each downwind distance over the 36 azimuth angles for each meteorological station were used to develop the attached tables.

A sample AERMOD model input file is given in Exhibit 1.

found at http://www.valleyair.org/Workshops/postings/2014/10-09-14_OEHHA/Draft-Staff-Report-9-23-14.pdf, accessed on March 2, 2015.

Figure 1: Meteorological Monitoring Stations in the South Coast Air Basin

Table 2: Locations of Meteorological Stations and Elevations

	UTM Coordinates (km)		Lat./Long. Coordinates		Elevation
Station name	**Easting**	**Northing**	**Latitude**	**Longitude**	**(m)**
Anaheim	413.14	3743.57	33:49:50	117:56:19	41
Azusa	414.81	3777.47	34:08:11	117:55:26	182
Banning	513.10	3753.19	33:55:15	116:51:30	660
Burbank	378.62	3782.24	34:10:33	118:19:01	175
Central LA	386.79	3770.00	34:03:59	118:13:36	87
Compton	388.59	3751.88	33:54:05	118:12:18	22
Costa Mesa	414.16	3726.19	33:40:26	117:55:33	20
Crestline	474.62	3788.76	34:14:29	117:16:32	1387
Fontana	454.62	3773.19	34:06:01	117:29:31	367
Indio	572.67	3729.90	33:42:30	116:12:57	-4
La Habra	411.98	3754.08	33:55:31	117:57:08	82
Lake Elsinore	469.33	3726.13	33:40:35	117:19:51	406
LAX	367.83	3757.80	33:57:15	118:25:49	42
Long Beach	389.99	3743.04	33:49:25	118:11:19	30
Lynwood	388.07	3754.73	33:55:44	118:12:39	29
Mission Viejo	437.39	3721.17	33:37:49	117:40:30	170
Palm Springs	542.46	3745.73	33:51:10	116:32:28	171
Perris	478.91	3738.58	33:47:20	117:13:40	442
Pico Rivera	401.31	3763.61	34:00:37	118:04:07	58
Pomona	430.78	3769.61	34:04:00	117:45:00	270
Redlands	486.36	3768.50	34:03:32	117:08:52	481
Reseda	358.76	3785.11	34:11:57	118:31:58	228
Riverside	461.64	3762.10	34:00:02	117:24:55	250
San Bernardino	474.76	3773.82	34:06:24	117:16:25	305
Santa Clarita	359.48	3805.52	34:23:00	118:31:42	375
Upland	441.96	3773.66	34:06:14	117:37:45	379
West LA	365.54	3768.52	34:03:02	118:27:24	97

Exhibit 1: AERMOD Model Input File for Combustion Sources

```
CO STARTING
   TITLEONE COMBUSTION SCREENING TABLE - ANAH
   TITLETWO 8 HRS/DAY; 7 DAYS/WEEK; 52 WEEKS/YR
   MODELOPT CONC FLAT
   AVERTIME 1   PERIOD
   POLLUTID ANY
   RUNORNOT RUN
   URBANOPT 3010759 OC
CO FINISHED

SO STARTING
   LOCATION D1 POINT     0.0    0.0    0.0
   LOCATION D2 POINT     0.0    0.0    0.0
   LOCATION D3 POINT     0.0    0.0    0.0
   LOCATION D4 POINT     0.0    0.0    0.0
   LOCATION D5 POINT     0.0    0.0    0.0
   LOCATION N1 POINT     0.0    0.0    0.0
   LOCATION N2 POINT     0.0    0.0    0.0
   LOCATION N3 POINT     0.0    0.0    0.0
   LOCATION N4 POINT     0.0    0.0    0.0
   LOCATION N5 POINT     0.0    0.0    0.0
   LOCATION B1 POINT     0.0    0.0    0.0
   LOCATION B2 POINT     0.0    0.0    0.0
   LOCATION B3 POINT     0.0    0.0    0.0
   LOCATION B4 POINT     0.0    0.0    0.0
   LOCATION B5 POINT     0.0    0.0    0.0
   LOCATION B6 POINT     0.0    0.0    0.0
   LOCATION B7 POINT     0.0    0.0    0.0

** POINT SOURCE      Q      RELHGT   TEMP     VEL      DIA
**                ---------  ------  ------  ------   ------
   SRCPARAM D1     0.0865     3.0     760    65.0     0.09
   SRCPARAM D2     0.0865     3.0     760    55.0     0.12
   SRCPARAM D3     0.0865     3.0     760    80.0     0.13
   SRCPARAM D4     0.0865     3.0     770    90.0     0.15
   SRCPARAM D5     0.0865     4.0     800   160.0     0.17
   SRCPARAM N1     0.0865     4.0     850    40.0     0.07
   SRCPARAM N2     0.0865     4.0     850    65.0     0.08
   SRCPARAM N3     0.0865     4.0     890    55.0     0.14
   SRCPARAM N4     0.0865     5.0     820    60.0     0.19
   SRCPARAM N5     0.0865     7.0     750    65.0     0.35
   SRCPARAM B1     0.0865     9.0     440     5.0     0.40
   SRCPARAM B2     0.0865     9.0     470     7.0     0.50
   SRCPARAM B3     0.0865     9.0     470     9.0     0.55
   SRCPARAM B4     0.0865    10.0     470    10.0     0.67
   SRCPARAM B5     0.0865    10.0     495    12.0     0.72
   SRCPARAM B6     0.0865    14.0     440    10.0     1.10
   SRCPARAM B7     0.0865    16.0     430    12.0     1.50

   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID D1             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D1             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D1             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID D1             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D1             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D1             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN D1             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D1             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D1             34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN D1             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D1             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D1             34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    D1            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D1            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D1            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    D1            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D1            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D1            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
```

```
YBADJ    D1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D1           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT D2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID D2          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D2          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D2          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID D2          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D2          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D2          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN D2          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D2          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D2          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN D2          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D2          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D2          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    D2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    D2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    D2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D2           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT D3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID D3          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D3          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D3          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID D3          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D3          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D3          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN D3          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D3          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D3          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN D3          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D3          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D3          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    D3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    D3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    D3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D3           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT D4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID D4          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D4          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D4          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID D4          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D4          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D4          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN D4          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D4          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D4          34.60    35.84    35.98    35.03    33.02    30.00
```

```
BUILDLEN D4        33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D4        29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D4        34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    D4       -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D4       -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D4       -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    D4       -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D4       -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D4       -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    D4         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4         0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT D5         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5         4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID D5        24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D5        35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D5        35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID D5        24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D5        35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D5        35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN D5        33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D5        29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D5        34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN D5        33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D5        29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D5        34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    D5       -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D5       -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D5       -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    D5       -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D5       -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D5       -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    D5         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5         0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT N1         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1         4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N1        24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N1        35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N1        35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N1        24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N1        35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N1        35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N1        33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N1        29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N1        34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N1        33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N1        29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N1        34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N1       -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N1       -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N1       -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N1       -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N1       -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N1       -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N1         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1         0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1         0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT N2         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2         4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2         4.00     4.00     4.00     4.00     4.00     4.00
```

```
BUILDHGT N2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N2          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N2          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N2          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N2          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N2          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N2          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N2          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N2          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N2          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N2          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N2          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N2          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N3          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N3          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N3          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N3          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N3          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N3          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N3          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N3          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N3          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N3          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N3          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N3          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N4          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N4          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N4          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N4          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N4          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N4          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N4          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N4          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N4          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N4          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N4          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N4          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N4         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N4         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N4         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N4         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
```

XBADJ	N4	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	N4	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00

BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDWID	N5	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	N5	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	N5	35.84	34.60	32.32	29.05	24.91	20.00
BUILDWID	N5	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	N5	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	N5	35.84	34.60	32.32	29.05	24.91	20.00
BUILDLEN	N5	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	N5	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	N5	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLEN	N5	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	N5	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	N5	34.60	35.84	35.98	35.03	33.02	30.00
XBADJ	N5	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	N5	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	N5	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
XBADJ	N5	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	N5	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	N5	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00

BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDWID	B1	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B1	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B1	35.84	34.60	32.32	29.05	24.91	20.00
BUILDWID	B1	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B1	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B1	35.84	34.60	32.32	29.05	24.91	20.00
BUILDLEN	B1	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	B1	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	B1	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLEN	B1	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	B1	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	B1	34.60	35.84	35.98	35.03	33.02	30.00
XBADJ	B1	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	B1	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	B1	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
XBADJ	B1	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	B1	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	B1	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00

BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDWID	B2	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B2	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B2	35.84	34.60	32.32	29.05	24.91	20.00
BUILDWID	B2	24.91	29.05	32.32	34.60	35.84	35.98

```
   BUILDWID B2             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B2             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN B2             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B2             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B2             34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN B2             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B2             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B2             34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B2            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B2            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B2            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B2            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B2            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B2            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B2              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2              0.00     0.00     0.00     0.00     0.00     0.00

   BUILDHGT B3              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID B3             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B3             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B3             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID B3             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B3             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B3             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN B3             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B3             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B3             34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN B3             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B3             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B3             34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B3            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B3            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B3            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B3            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B3            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B3            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B3              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3              0.00     0.00     0.00     0.00     0.00     0.00

   BUILDHGT B4              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID B4             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B4             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B4             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID B4             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B4             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B4             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN B4             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B4             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B4             34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN B4             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B4             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B4             34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B4            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B4            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B4            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B4            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B4            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B4            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B4              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4              0.00     0.00     0.00     0.00     0.00     0.00
```

```
YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID B5          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B5          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B5          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID B5          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B5          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B5          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN B5          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B5          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B5          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN B5          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B5          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B5          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    B5         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B5         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B5         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    B5         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B5         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B5         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    B5           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT B6           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID B6          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B6          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B6          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID B6          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B6          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B6          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN B6          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B6          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B6          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN B6          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B6          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B6          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    B6         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B6         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B6         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    B6         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B6         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B6         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    B6           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6           0.00     0.00     0.00     0.00     0.00     0.00

BUILDHGT B7           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID B7          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B7          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B7          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID B7          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B7          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B7          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN B7          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B7          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B7          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN B7          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B7          29.05    24.91    20.00    24.91    29.05    32.32
```

```
   BUILDLEN B7             34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B7            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B7            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B7            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B7            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B7            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B7            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B7              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7              0.00     0.00     0.00     0.00     0.00     0.00

   URBANSRC D1
   URBANSRC D2
   URBANSRC D3
   URBANSRC D4
   URBANSRC D5
   URBANSRC N1
   URBANSRC N2
   URBANSRC N3
   URBANSRC N4
   URBANSRC N5
   URBANSRC B1
   URBANSRC B2
   URBANSRC B3
   URBANSRC B4
   URBANSRC B5
   URBANSRC B6
   URBANSRC B7

SO EMISFACT  D1-D5  HROFDY  8*0.0   8*1.0   8*0.0
SO EMISFACT  N1-N5  HROFDY  8*0.0   8*1.0   8*0.0
SO EMISFACT  B1-B7  HROFDY  8*0.0   8*1.0   8*0.0

   SRCGROUP  D1  D1
   SRCGROUP  D2  D2
   SRCGROUP  D3  D3
   SRCGROUP  D4  D4
   SRCGROUP  D5  D5
   SRCGROUP  N1  N1
   SRCGROUP  N2  N2
   SRCGROUP  N3  N3
   SRCGROUP  N4  N4
   SRCGROUP  N5  N5
   SRCGROUP  B1  B1
   SRCGROUP  B2  B2
   SRCGROUP  B3  B3
   SRCGROUP  B4  B4
   SRCGROUP  B5  B5
   SRCGROUP  B6  B6
   SRCGROUP  B7  B7

SO FINISHED

RE STARTING
   GRIDPOLR POL1 STA
                 ORIG     0.0     0.0
                 DIST  25 50 75 100 200 300 500 1000
                 GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED

ME STARTING
   SURFFILE ANAH8.SFC
   PROFFILE ANAH8.PFL
   SURFDATA 0 2006
   UAIRDATA 3190 2006
   PROFBASE 0.0 METERS
ME FINISHED

OU STARTING
   RECTABLE  1       FIRST
   RECTABLE  ALLAVE  FIRST
   PLOTFILE   1 D1 FIRST AM1T1D1.TXT
   PLOTFILE   PERIOD D1 AM1T2D1.TXT
   PLOTFILE   1 D2 FIRST AM1T1D2.TXT
   PLOTFILE   PERIOD D2 AM1T2D2.TXT
   PLOTFILE   1 D3 FIRST AM1T1D3.TXT
   PLOTFILE   PERIOD D3 AM1T2D3.TXT
```

```
   PLOTFILE   1 D4 FIRST AM1T1D4.TXT
   PLOTFILE   PERIOD D4 AM1T2D4.TXT
   PLOTFILE   1 D5 FIRST AM1T1D5.TXT
   PLOTFILE   PERIOD D5 AM1T2D5.TXT
   PLOTFILE   1 N1 FIRST AM1T1N1.TXT
   PLOTFILE   PERIOD N1 AM1T2N1.TXT
   PLOTFILE   1 N2 FIRST AM1T1N2.TXT
   PLOTFILE   PERIOD N2 AM1T2N2.TXT
   PLOTFILE   1 N3 FIRST AM1T1N3.TXT
   PLOTFILE   PERIOD N3 AM1T2N3.TXT
   PLOTFILE   1 N4 FIRST AM1T1N4.TXT
   PLOTFILE   PERIOD N4 AM1T2N4.TXT
   PLOTFILE   1 N5 FIRST AM1T1N5.TXT
   PLOTFILE   PERIOD N5 AM1T2N5.TXT
   PLOTFILE   1 B1 FIRST AM1T1B1.TXT
   PLOTFILE   PERIOD B1 AM1T2B1.TXT
   PLOTFILE   1 B2 FIRST AM1T1B2.TXT
   PLOTFILE   PERIOD B2 AM1T2B2.TXT
   PLOTFILE   1 B3 FIRST AM1T1B3.TXT
   PLOTFILE   PERIOD B3 AM1T2B3.TXT
   PLOTFILE   1 B4 FIRST AM1T1B4.TXT
   PLOTFILE   PERIOD B4 AM1T2B4.TXT
   PLOTFILE   1 B5 FIRST AM1T1B5.TXT
   PLOTFILE   PERIOD B5 AM1T2B5.TXT
   PLOTFILE   1 B6 FIRST AM1T1B6.TXT
   PLOTFILE   PERIOD B6 AM1T2B6.TXT
   PLOTFILE   1 B7 FIRST AM1T1B7.TXT
   PLOTFILE   PERIOD B7 AM1T2B7.TXT
OU FINISHED
```

Results

Figure 2 shows the source receptor areas (SRA) within the South Coast Air Basin and Table 3 lists the appropriate meteorological station to use for each SRA.

Figure 2: Source/Receptor Areas

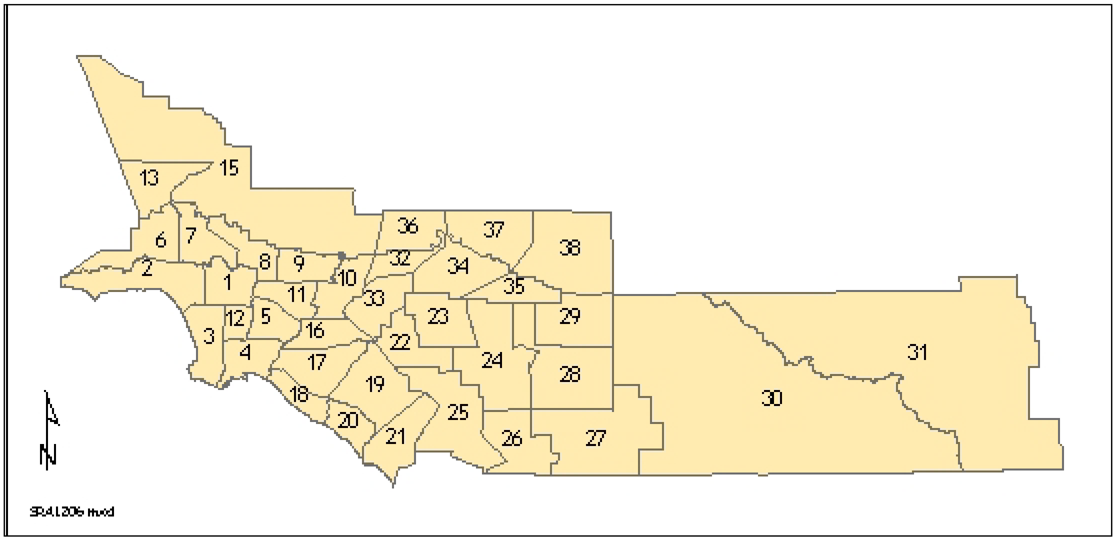


Table 3: Meteorological Stations for Each Source/Receptor Area.

Meteorological Station	Source/ Receptor Area	Meteorological Station	Source/ Receptor Area
Anaheim	17	Compton/Lynwood	12
Azusa	8, 9	Mission Viejo	19, 21
Banning	29	Perris	24, 28
Burbank	7	Palm Springs	30, 31
Central LA	1	Pico Rivera	5, 11
Crestline	37	Pomona	10
Costa Mesa	18, 20	Redlands	35, 38
Fontana	34	Reseda	6
Indio	30	Riverside	22, 23
La Habra	16	Santa Clarita	13, 15
Lake Elsinore	25, 26, 27	San Bernardino	34
LAX	3	Upland	32, 33, 36
Long Beach	4	West LA	2

The following tables have been numbered to match the tables within Permit Application Attachment "M" for the Risk Assessment Procedures for Rules 1401 & 212.

Table 2.11
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 0 to 4.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
0 to 4.9	Anaheim	19.45	5.00	3.06	1.92	0.45	0.18	0.06	0.02
0 to 4.9	Azusa	14.24	4.45	2.79	1.77	0.42	0.16	0.06	0.01
0 to 4.9	Banning	14.79	4.63	3.05	2.06	0.57	0.23	0.08	0.02
0 to 4.9	Burbank	12.06	3.41	2.04	1.25	0.28	0.11	0.04	0.01
0 to 4.9	Central LA	15.37	3.93	2.37	1.48	0.35	0.14	0.05	0.01
0 to 4.9	Compton	13.44	3.82	2.34	1.46	0.35	0.13	0.05	0.01
0 to 4.9	Costa Mesa	11.23	3.89	2.46	1.54	0.36	0.14	0.05	0.01
0 to 4.9	Crestline	10.79	3.33	2.06	1.28	0.30	0.12	0.04	0.01
0 to 4.9	Fontana	16.80	4.91	3.15	2.04	0.51	0.20	0.07	0.02
0 to 4.9	Indio	8.84	2.98	1.88	1.19	0.29	0.12	0.04	0.01
0 to 4.9	La Habra	13.36	4.10	2.48	1.53	0.35	0.14	0.05	0.01
0 to 4.9	Lake Elsinore	9.25	3.24	2.08	1.32	0.31	0.12	0.04	0.01
0 to 4.9	LAX	22.89	5.92	3.76	2.46	0.63	0.25	0.08	0.02
0 to 4.9	Long Beach	10.78	3.04	1.83	1.13	0.27	0.10	0.04	0.01
0 to 4.9	Lynwood	14.10	4.20	2.61	1.65	0.39	0.15	0.05	0.01
0 to 4.9	Mission Viejo	10.10	3.21	2.03	1.27	0.30	0.12	0.04	0.01
0 to 4.9	Palm Springs	8.32	2.63	1.60	1.01	0.25	0.10	0.03	0.01
0 to 4.9	Perris	8.42	2.79	1.79	1.17	0.30	0.12	0.04	0.01
0 to 4.9	Pico Rivera	15.61	4.20	2.58	1.62	0.39	0.16	0.05	0.01
0 to 4.9	Pomona	13.12	3.99	2.41	1.48	0.34	0.13	0.05	0.01
0 to 4.9	Redlands	10.94	4.09	2.55	1.58	0.36	0.14	0.05	0.01
0 to 4.9	Reseda	5.99	2.45	1.45	0.87	0.19	0.08	0.03	0.01
0 to 4.9	Riverside	13.67	4.21	2.69	1.73	0.42	0.16	0.06	0.01
0 to 4.9	San Bernardino	12.15	3.79	2.34	1.48	0.36	0.14	0.05	0.01
0 to 4.9	Santa Clarita	12.15	3.44	2.18	1.43	0.37	0.15	0.06	0.01
0 to 4.9	Upland	15.43	4.68	2.99	1.92	0.47	0.18	0.06	0.02
0 to 4.9	West LA	15.74	4.37	2.64	1.62	0.37	0.15	0.05	0.01

Table 2.12
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 5 to 9.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
5 to 9.9	Anaheim	12.35	3.51	2.29	1.56	0.41	0.16	0.06	0.02
5 to 9.9	Azusa	7.76	2.83	1.93	1.35	0.37	0.15	0.05	0.01
5 to 9.9	Banning	11.43	3.66	2.49	1.79	0.53	0.22	0.08	0.02
5 to 9.9	Burbank	7.12	2.34	1.51	1.00	0.25	0.10	0.04	0.01
5 to 9.9	Central LA	10.41	2.91	1.86	1.25	0.32	0.13	0.04	0.01
5 to 9.9	Compton	8.06	2.62	1.74	1.18	0.31	0.12	0.04	0.01
5 to 9.9	Costa Mesa	5.62	2.37	1.64	1.15	0.31	0.13	0.05	0.01
5 to 9.9	Crestline	5.95	2.13	1.43	0.98	0.26	0.11	0.04	0.01
5 to 9.9	Fontana	10.83	3.39	2.31	1.64	0.46	0.19	0.07	0.02
5 to 9.9	Indio	5.34	1.94	1.35	0.94	0.26	0.11	0.04	0.01
5 to 9.9	La Habra	7.11	2.58	1.71	1.16	0.30	0.12	0.05	0.01
5 to 9.9	Lake Elsinore	4.66	1.80	1.29	0.93	0.27	0.11	0.04	0.01
5 to 9.9	LAX	16.06	4.44	2.95	2.08	0.58	0.23	0.08	0.02
5 to 9.9	Long Beach	6.26	2.09	1.36	0.90	0.24	0.09	0.03	0.01
5 to 9.9	Lynwood	8.13	2.78	1.86	1.29	0.35	0.14	0.05	0.01
5 to 9.9	Mission Viejo	5.40	1.97	1.36	0.95	0.26	0.11	0.04	0.01
5 to 9.9	Palm Springs	5.74	1.84	1.22	0.83	0.22	0.09	0.03	0.01
5 to 9.9	Perris	5.71	1.94	1.32	0.94	0.27	0.11	0.04	0.01
5 to 9.9	Pico Rivera	10.07	2.99	1.94	1.32	0.35	0.14	0.05	0.01
5 to 9.9	Pomona	7.57	2.63	1.72	1.16	0.30	0.12	0.04	0.01
5 to 9.9	Redlands	5.08	2.31	1.62	1.14	0.31	0.13	0.05	0.01
5 to 9.9	Reseda	3.43	1.41	0.93	0.62	0.17	0.07	0.03	0.01
5 to 9.9	Riverside	7.93	2.75	1.91	1.35	0.37	0.15	0.06	0.01
5 to 9.9	San Bernardino	7.32	2.49	1.67	1.15	0.32	0.13	0.05	0.01
5 to 9.9	Santa Clarita	9.63	2.78	1.82	1.26	0.35	0.15	0.05	0.01
5 to 9.9	Upland	8.96	3.05	2.11	1.50	0.41	0.17	0.06	0.02
5 to 9.9	West LA	9.73	3.04	1.96	1.31	0.34	0.14	0.05	0.01

Table 2.13
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 10 to 19.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
10 to 19.9	Anaheim	8.71	2.66	1.81	1.26	0.37	0.16	0.06	0.02
10 to 19.9	Azusa	4.89	1.96	1.40	1.01	0.32	0.14	0.05	0.01
10 to 19.9	Banning	9.24	3.07	2.12	1.53	0.49	0.20	0.07	0.02
10 to 19.9	Burbank	4.65	1.70	1.15	0.78	0.22	0.09	0.03	0.01
10 to 19.9	Central LA	7.74	2.31	1.53	1.05	0.29	0.12	0.04	0.01
10 to 19.9	Compton	5.65	2.00	1.38	0.95	0.28	0.12	0.04	0.01
10 to 19.9	Costa Mesa	3.20	1.52	1.13	0.82	0.27	0.12	0.04	0.01
10 to 19.9	Crestline	3.82	1.47	1.05	0.74	0.23	0.10	0.04	0.01
10 to 19.9	Fontana	7.85	2.57	1.80	1.30	0.41	0.18	0.07	0.02
10 to 19.9	Indio	3.69	1.41	1.01	0.74	0.23	0.10	0.04	0.01
10 to 19.9	La Habra	4.38	1.75	1.23	0.86	0.26	0.12	0.04	0.01
10 to 19.9	Lake Elsinore	2.90	1.18	0.89	0.67	0.23	0.10	0.04	0.01
10 to 19.9	LAX	12.32	3.62	2.45	1.74	0.53	0.22	0.08	0.02
10 to 19.9	Long Beach	3.94	1.51	1.03	0.71	0.21	0.09	0.03	0.01
10 to 19.9	Lynwood	5.47	2.06	1.43	1.02	0.31	0.13	0.05	0.01
10 to 19.9	Mission Viejo	3.18	1.30	0.96	0.69	0.22	0.10	0.04	0.01
10 to 19.9	Palm Springs	4.47	1.45	1.00	0.70	0.21	0.09	0.03	0.01
10 to 19.9	Perris	4.41	1.53	1.06	0.77	0.25	0.11	0.04	0.01
10 to 19.9	Pico Rivera	7.20	2.28	1.53	1.06	0.31	0.13	0.05	0.01
10 to 19.9	Pomona	5.03	1.91	1.30	0.90	0.27	0.12	0.04	0.01
10 to 19.9	Redlands	2.85	1.46	1.10	0.81	0.27	0.12	0.05	0.01
10 to 19.9	Reseda	2.56	1.10	0.75	0.52	0.15	0.07	0.03	0.01
10 to 19.9	Riverside	5.32	1.99	1.44	1.05	0.33	0.14	0.05	0.01
10 to 19.9	San Bernardino	5.08	1.82	1.27	0.91	0.28	0.12	0.05	0.01
10 to 19.9	Santa Clarita	7.96	2.39	1.59	1.11	0.33	0.14	0.05	0.01
10 to 19.9	Upland	5.96	2.19	1.58	1.15	0.36	0.16	0.06	0.02
10 to 19.9	West LA	6.64	2.28	1.53	1.04	0.30	0.13	0.05	0.01

Table 2.14
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 20 to 29.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
20 to 29.9	Anaheim	4.70	1.65	1.26	0.92	0.31	0.14	0.05	0.01
20 to 29.9	Azusa	1.87	0.90	0.77	0.61	0.24	0.12	0.05	0.01
20 to 29.9	Banning	5.42	1.89	1.48	1.12	0.42	0.19	0.07	0.02
20 to 29.9	Burbank	2.06	0.91	0.71	0.53	0.18	0.08	0.03	0.01
20 to 29.9	Central LA	4.34	1.47	1.10	0.79	0.25	0.11	0.04	0.01
20 to 29.9	Compton	2.52	1.05	0.84	0.63	0.22	0.10	0.04	0.01
20 to 29.9	Costa Mesa	0.99	0.59	0.55	0.46	0.20	0.10	0.04	0.01
20 to 29.9	Crestline	1.76	0.78	0.65	0.50	0.19	0.09	0.04	0.01
20 to 29.9	Fontana	4.20	1.52	1.20	0.91	0.34	0.16	0.06	0.02
20 to 29.9	Indio	1.88	0.80	0.65	0.51	0.19	0.09	0.04	0.01
20 to 29.9	La Habra	1.84	0.87	0.72	0.56	0.21	0.10	0.04	0.01
20 to 29.9	Lake Elsinore	1.38	0.64	0.55	0.45	0.19	0.09	0.04	0.01
20 to 29.9	LAX	7.06	2.36	1.77	1.29	0.45	0.20	0.07	0.02
20 to 29.9	Long Beach	1.00	0.62	0.56	0.43	0.16	0.08	0.03	0.01
20 to 29.9	Lynwood	2.27	1.03	0.84	0.64	0.24	0.12	0.05	0.01
20 to 29.9	Mission Viejo	1.06	0.56	0.51	0.42	0.18	0.09	0.04	0.01
20 to 29.9	Palm Springs	2.79	0.98	0.74	0.54	0.18	0.08	0.03	0.01
20 to 29.9	Perris	2.60	0.99	0.76	0.57	0.21	0.10	0.04	0.01
20 to 29.9	Pico Rivera	3.62	1.32	1.01	0.75	0.26	0.12	0.05	0.01
20 to 29.9	Pomona	2.39	1.02	0.81	0.60	0.22	0.10	0.04	0.01
20 to 29.9	Redlands	0.90	0.60	0.57	0.47	0.21	0.11	0.04	0.01
20 to 29.9	Reseda	1.20	0.65	0.50	0.37	0.13	0.06	0.02	0.01
20 to 29.9	Riverside	2.25	0.96	0.82	0.65	0.26	0.13	0.05	0.01
20 to 29.9	San Bernardino	2.68	1.07	0.85	0.64	0.24	0.11	0.04	0.01
20 to 29.9	Santa Clarita	4.78	1.62	1.18	0.86	0.29	0.13	0.05	0.01
20 to 29.9	Upland	2.55	1.08	0.91	0.72	0.29	0.14	0.05	0.02
20 to 29.9	West LA	2.93	1.17	0.93	0.69	0.25	0.12	0.05	0.01

Table 2.15
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 30 to 49.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
30 to 49.9	Anaheim	2.71	1.03	0.86	0.68	0.26	0.13	0.05	0.01
30 to 49.9	Azusa	0.83	0.50	0.49	0.43	0.20	0.11	0.04	0.01
30 to 49.9	Banning	4.09	1.42	1.14	0.90	0.36	0.17	0.07	0.02
30 to 49.9	Burbank	1.01	0.53	0.47	0.38	0.15	0.08	0.03	0.01
30 to 49.9	Central LA	2.88	1.03	0.83	0.63	0.22	0.10	0.04	0.01
30 to 49.9	Compton	1.42	0.66	0.59	0.47	0.19	0.09	0.04	0.01
30 to 49.9	Costa Mesa	0.35	0.31	0.34	0.32	0.17	0.09	0.04	0.01
30 to 49.9	Crestline	0.99	0.48	0.44	0.37	0.16	0.08	0.03	0.01
30 to 49.9	Fontana	2.67	1.00	0.85	0.69	0.29	0.14	0.06	0.02
30 to 49.9	Indio	1.11	0.50	0.44	0.37	0.16	0.08	0.03	0.01
30 to 49.9	La Habra	0.83	0.48	0.46	0.39	0.18	0.09	0.04	0.01
30 to 49.9	Lake Elsinore	0.70	0.38	0.36	0.31	0.15	0.08	0.03	0.01
30 to 49.9	LAX	4.60	1.61	1.29	1.00	0.38	0.18	0.07	0.02
30 to 49.9	Long Beach	0.39	0.36	0.37	0.32	0.14	0.07	0.03	0.01
30 to 49.9	Lynwood	1.07	0.59	0.54	0.45	0.20	0.10	0.04	0.01
30 to 49.9	Mission Viejo	0.40	0.30	0.31	0.29	0.15	0.08	0.03	0.01
30 to 49.9	Palm Springs	2.10	0.74	0.58	0.44	0.16	0.07	0.03	0.01
30 to 49.9	Perris	1.86	0.72	0.57	0.45	0.18	0.09	0.04	0.01
30 to 49.9	Pico Rivera	2.24	0.87	0.72	0.57	0.22	0.11	0.04	0.01
30 to 49.9	Pomona	1.35	0.63	0.55	0.44	0.18	0.09	0.04	0.01
30 to 49.9	Redlands	0.39	0.35	0.37	0.34	0.18	0.10	0.04	0.01
30 to 49.9	Reseda	0.76	0.46	0.38	0.29	0.11	0.06	0.02	0.01
30 to 49.9	Riverside	1.14	0.55	0.53	0.46	0.22	0.11	0.05	0.01
30 to 49.9	San Bernardino	1.61	0.68	0.58	0.47	0.20	0.10	0.04	0.01
30 to 49.9	Santa Clarita	3.66	1.28	0.97	0.73	0.25	0.12	0.05	0.01
30 to 49.9	Upland	1.24	0.59	0.57	0.50	0.23	0.12	0.05	0.01
30 to 49.9	West LA	1.50	0.68	0.61	0.49	0.21	0.11	0.04	0.01

Table 2.16
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 50 to 149.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
50 to 149.9	Anaheim	0.03	0.11	0.19	0.24	0.18	0.11	0.05	0.01
50 to 149.9	Azusa	0.04	0.14	0.20	0.22	0.15	0.09	0.04	0.01
50 to 149.9	Banning	0.01	0.02	0.08	0.16	0.20	0.13	0.06	0.02
50 to 149.9	Burbank	0.03	0.13	0.18	0.19	0.12	0.07	0.03	0.01
50 to 149.9	Central LA	0.02	0.10	0.17	0.21	0.15	0.09	0.04	0.01
50 to 149.9	Compton	0.04	0.12	0.19	0.21	0.14	0.08	0.04	0.01
50 to 149.9	Costa Mesa	0.05	0.12	0.16	0.18	0.13	0.08	0.04	0.01
50 to 149.9	Crestline	0.04	0.10	0.16	0.17	0.12	0.07	0.03	0.01
50 to 149.9	Fontana	0.02	0.08	0.15	0.20	0.18	0.12	0.05	0.02
50 to 149.9	Indio	0.04	0.09	0.13	0.15	0.11	0.07	0.03	0.01
50 to 149.9	La Habra	0.06	0.14	0.19	0.20	0.14	0.08	0.04	0.01
50 to 149.9	Lake Elsinore	0.04	0.10	0.13	0.14	0.11	0.07	0.03	0.01
50 to 149.9	LAX	0.01	0.09	0.19	0.26	0.23	0.14	0.06	0.02
50 to 149.9	Long Beach	0.03	0.11	0.16	0.17	0.11	0.06	0.03	0.01
50 to 149.9	Lynwood	0.10	0.18	0.22	0.23	0.15	0.09	0.04	0.01
50 to 149.9	Mission Viejo	0.03	0.10	0.14	0.16	0.11	0.07	0.03	0.01
50 to 149.9	Palm Springs	0.07	0.12	0.16	0.17	0.11	0.06	0.03	0.01
50 to 149.9	Perris	0.06	0.10	0.12	0.14	0.11	0.07	0.03	0.01
50 to 149.9	Pico Rivera	0.02	0.11	0.18	0.21	0.15	0.09	0.04	0.01
50 to 149.9	Pomona	0.09	0.16	0.20	0.21	0.14	0.08	0.04	0.01
50 to 149.9	Redlands	0.07	0.14	0.18	0.20	0.14	0.08	0.04	0.01
50 to 149.9	Reseda	0.12	0.18	0.18	0.16	0.09	0.05	0.02	0.01
50 to 149.9	Riverside	0.04	0.10	0.16	0.20	0.16	0.10	0.04	0.01
50 to 149.9	San Bernardino	0.08	0.13	0.17	0.19	0.14	0.08	0.04	0.01
50 to 149.9	Santa Clarita	0.04	0.07	0.12	0.18	0.16	0.10	0.04	0.01
50 to 149.9	Upland	0.03	0.10	0.17	0.21	0.17	0.10	0.05	0.01
50 to 149.9	West LA	0.03	0.13	0.20	0.22	0.16	0.09	0.04	0.01

Table 2.17
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating 12 Hours per Day or Less

Natural Gas Boiler Rating 150 to 200 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
150 to 200	Anaheim	0.01	0.04	0.08	0.12	0.12	0.08	0.04	0.01
150 to 200	Azusa	0.02	0.07	0.10	0.12	0.10	0.07	0.03	0.01
150 to 200	Banning	0.00	0.01	0.03	0.06	0.12	0.10	0.05	0.02
150 to 200	Burbank	0.01	0.06	0.09	0.10	0.08	0.05	0.02	0.01
150 to 200	Central LA	0.01	0.05	0.08	0.10	0.10	0.07	0.03	0.01
150 to 200	Compton	0.02	0.05	0.08	0.10	0.10	0.06	0.03	0.01
150 to 200	Costa Mesa	0.02	0.05	0.08	0.09	0.09	0.06	0.03	0.01
150 to 200	Crestline	0.02	0.05	0.07	0.09	0.08	0.05	0.03	0.01
150 to 200	Fontana	0.01	0.04	0.07	0.09	0.12	0.08	0.04	0.01
150 to 200	Indio	0.02	0.04	0.06	0.08	0.07	0.05	0.03	0.01
150 to 200	La Habra	0.03	0.06	0.09	0.10	0.09	0.06	0.03	0.01
150 to 200	Lake Elsinore	0.02	0.05	0.07	0.08	0.07	0.05	0.02	0.01
150 to 200	LAX	0.01	0.04	0.09	0.13	0.15	0.11	0.05	0.02
150 to 200	Long Beach	0.01	0.05	0.08	0.09	0.07	0.05	0.02	0.01
150 to 200	Lynwood	0.04	0.08	0.11	0.12	0.10	0.07	0.03	0.01
150 to 200	Mission Viejo	0.01	0.04	0.07	0.08	0.07	0.05	0.02	0.01
150 to 200	Palm Springs	0.03	0.06	0.07	0.08	0.08	0.05	0.02	0.01
150 to 200	Perris	0.03	0.05	0.06	0.07	0.07	0.05	0.03	0.01
150 to 200	Pico Rivera	0.01	0.05	0.09	0.11	0.10	0.07	0.03	0.01
150 to 200	Pomona	0.04	0.08	0.10	0.11	0.09	0.06	0.03	0.01
150 to 200	Redlands	0.03	0.07	0.09	0.10	0.09	0.06	0.03	0.01
150 to 200	Reseda	0.05	0.09	0.10	0.09	0.06	0.04	0.02	0.01
150 to 200	Riverside	0.02	0.04	0.07	0.10	0.10	0.07	0.04	0.01
150 to 200	San Bernardino	0.03	0.06	0.08	0.09	0.09	0.06	0.03	0.01
150 to 200	Santa Clarita	0.02	0.04	0.05	0.07	0.11	0.08	0.04	0.01
150 to 200	Upland	0.01	0.04	0.07	0.10	0.11	0.08	0.04	0.01
150 to 200	West LA	0.01	0.06	0.10	0.12	0.11	0.07	0.03	0.01

Table 3.11
Dispersion Factors (χ/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 0 to 4.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
0 to 4.9	Anaheim	12.59	3.18	2.09	1.49	0.59	0.35	0.18	0.07
0 to 4.9	Azusa	10.78	2.95	2.08	1.55	0.68	0.38	0.19	0.08
0 to 4.9	Banning	17.84	5.35	3.78	2.84	1.14	0.60	0.30	0.12
0 to 4.9	Burbank	12.48	3.00	2.05	1.52	0.66	0.36	0.18	0.07
0 to 4.9	Central LA	10.39	2.50	1.69	1.24	0.55	0.30	0.15	0.06
0 to 4.9	Compton	9.04	2.39	1.68	1.26	0.62	0.37	0.19	0.08
0 to 4.9	Costa Mesa	5.49	1.80	1.23	0.87	0.42	0.29	0.16	0.07
0 to 4.9	Crestline	8.01	2.23	1.46	1.03	0.44	0.27	0.16	0.06
0 to 4.9	Fontana	14.09	3.90	2.70	1.99	0.80	0.45	0.24	0.10
0 to 4.9	Indio	14.83	4.24	2.91	2.17	0.90	0.51	0.27	0.11
0 to 4.9	La Habra	7.07	2.04	1.32	0.91	0.43	0.28	0.15	0.06
0 to 4.9	Lake Elsinore	5.38	1.70	1.16	0.81	0.41	0.30	0.18	0.08
0 to 4.9	LAX	14.33	3.69	2.50	1.80	0.70	0.38	0.19	0.07
0 to 4.9	Long Beach	6.98	2.12	1.57	1.23	0.63	0.37	0.20	0.08
0 to 4.9	Lynwood	9.10	2.47	1.71	1.26	0.60	0.37	0.20	0.08
0 to 4.9	Mission Viejo	6.03	1.69	1.13	0.80	0.38	0.26	0.15	0.06
0 to 4.9	Palm Springs	14.03	3.59	2.41	1.77	0.75	0.44	0.23	0.09
0 to 4.9	Perris	7.08	2.14	1.46	1.07	0.48	0.31	0.18	0.07
0 to 4.9	Pico Rivera	12.15	3.07	2.02	1.45	0.57	0.33	0.17	0.07
0 to 4.9	Pomona	8.33	2.31	1.55	1.12	0.58	0.38	0.22	0.09
0 to 4.9	Redlands	6.18	2.14	1.47	1.05	0.48	0.41	0.28	0.12
0 to 4.9	Reseda	3.67	1.17	0.76	0.53	0.32	0.24	0.14	0.06
0 to 4.9	Riverside	9.01	2.53	1.76	1.28	0.56	0.34	0.19	0.07
0 to 4.9	San Bernardino	11.16	3.10	2.09	1.54	0.68	0.41	0.23	0.09
0 to 4.9	Santa Clarita	9.34	2.44	1.61	1.16	0.48	0.30	0.17	0.07
0 to 4.9	Upland	11.03	3.04	2.12	1.55	0.67	0.41	0.26	0.11
0 to 4.9	West LA	7.88	2.13	1.37	0.94	0.40	0.26	0.15	0.06

Table 3.12
Dispersion Factors (X/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 5 to 9.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
5 to 9.9	Anaheim	6.90	1.85	1.19	0.86	0.28	0.15	0.11	0.06
5 to 9.9	Azusa	5.37	1.58	1.08	0.82	0.31	0.17	0.12	0.06
5 to 9.9	Banning	12.66	3.68	2.44	1.88	0.77	0.39	0.22	0.10
5 to 9.9	Burbank	6.60	1.63	1.04	0.78	0.31	0.17	0.12	0.06
5 to 9.9	Central LA	6.49	1.62	1.07	0.79	0.28	0.14	0.10	0.05
5 to 9.9	Compton	4.64	1.35	0.93	0.69	0.27	0.16	0.12	0.07
5 to 9.9	Costa Mesa	2.51	1.00	0.70	0.52	0.18	0.12	0.09	0.05
5 to 9.9	Crestline	4.46	1.31	0.83	0.61	0.22	0.12	0.09	0.05
5 to 9.9	Fontana	8.38	2.33	1.55	1.16	0.43	0.22	0.15	0.08
5 to 9.9	Indio	9.22	2.58	1.68	1.27	0.51	0.26	0.18	0.09
5 to 9.9	La Habra	3.52	1.17	0.77	0.55	0.19	0.12	0.09	0.04
5 to 9.9	Lake Elsinore	2.69	0.90	0.63	0.47	0.17	0.09	0.09	0.06
5 to 9.9	LAX	9.07	2.39	1.57	1.16	0.40	0.19	0.12	0.06
5 to 9.9	Long Beach	3.24	1.11	0.78	0.60	0.25	0.15	0.12	0.07
5 to 9.9	Lynwood	4.73	1.41	0.96	0.71	0.26	0.15	0.12	0.06
5 to 9.9	Mission Viejo	2.68	0.88	0.60	0.43	0.14	0.09	0.08	0.04
5 to 9.9	Palm Springs	9.03	2.25	1.46	1.09	0.42	0.22	0.15	0.07
5 to 9.9	Perris	4.26	1.30	0.85	0.63	0.23	0.13	0.10	0.05
5 to 9.9	Pico Rivera	6.98	1.83	1.15	0.84	0.29	0.15	0.11	0.05
5 to 9.9	Pomona	4.39	1.34	0.87	0.63	0.22	0.14	0.13	0.07
5 to 9.9	Redlands	2.71	1.10	0.78	0.58	0.21	0.13	0.14	0.09
5 to 9.9	Reseda	2.28	0.75	0.49	0.35	0.12	0.08	0.08	0.05
5 to 9.9	Riverside	4.70	1.43	0.99	0.74	0.26	0.14	0.11	0.06
5 to 9.9	San Bernardino	6.35	1.79	1.16	0.85	0.32	0.18	0.13	0.07
5 to 9.9	Santa Clarita	6.20	1.67	1.06	0.77	0.26	0.14	0.10	0.05
5 to 9.9	Upland	5.98	1.73	1.18	0.89	0.33	0.17	0.13	0.08
5 to 9.9	West LA	4.35	1.32	0.85	0.60	0.19	0.11	0.08	0.05

Table 3.13
Dispersion Factors (X/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 10 to 19.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
10 to 19.9	Anaheim	4.75	1.35	0.89	0.63	0.22	0.10	0.07	0.04
10 to 19.9	Azusa	3.20	1.04	0.73	0.54	0.21	0.10	0.07	0.05
10 to 19.9	Banning	9.68	2.87	1.86	1.35	0.58	0.29	0.17	0.09
10 to 19.9	Burbank	4.21	1.11	0.71	0.50	0.21	0.10	0.07	0.05
10 to 19.9	Central LA	4.63	1.23	0.83	0.59	0.22	0.11	0.06	0.04
10 to 19.9	Compton	3.00	0.96	0.67	0.49	0.18	0.10	0.07	0.05
10 to 19.9	Costa Mesa	1.38	0.63	0.47	0.35	0.13	0.08	0.06	0.04
10 to 19.9	Crestline	3.02	0.91	0.60	0.42	0.16	0.09	0.06	0.04
10 to 19.9	Fontana	5.92	1.69	1.12	0.82	0.31	0.15	0.10	0.06
10 to 19.9	Indio	6.91	1.94	1.22	0.88	0.37	0.19	0.12	0.07
10 to 19.9	La Habra	2.13	0.78	0.54	0.39	0.14	0.08	0.05	0.03
10 to 19.9	Lake Elsinore	1.70	0.60	0.43	0.33	0.13	0.06	0.05	0.04
10 to 19.9	LAX	6.65	1.83	1.21	0.87	0.31	0.14	0.08	0.05
10 to 19.9	Long Beach	1.93	0.77	0.56	0.41	0.16	0.09	0.07	0.05
10 to 19.9	Lynwood	2.97	0.99	0.69	0.50	0.19	0.10	0.07	0.05
10 to 19.9	Mission Viejo	1.50	0.56	0.40	0.29	0.10	0.06	0.05	0.03
10 to 19.9	Palm Springs	6.96	1.75	1.13	0.82	0.33	0.17	0.10	0.06
10 to 19.9	Perris	3.18	0.99	0.65	0.47	0.18	0.09	0.06	0.04
10 to 19.9	Pico Rivera	4.84	1.34	0.85	0.60	0.22	0.10	0.07	0.04
10 to 19.9	Pomona	2.82	0.94	0.63	0.45	0.16	0.08	0.07	0.05
10 to 19.9	Redlands	1.46	0.68	0.51	0.39	0.15	0.08	0.08	0.07
10 to 19.9	Reseda	1.67	0.57	0.38	0.27	0.10	0.05	0.04	0.03
10 to 19.9	Riverside	3.01	0.98	0.70	0.52	0.19	0.10	0.07	0.04
10 to 19.9	San Bernardino	4.51	1.30	0.85	0.61	0.23	0.12	0.08	0.06
10 to 19.9	Santa Clarita	4.81	1.34	0.85	0.60	0.21	0.10	0.06	0.04
10 to 19.9	Upland	3.81	1.18	0.82	0.61	0.23	0.12	0.08	0.06
10 to 19.9	West LA	2.86	0.95	0.64	0.44	0.15	0.08	0.05	0.04

Table 3.14
Dispersion Factors (X/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 20 to 29.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
20 to 29.9	Anaheim	2.23	0.75	0.57	0.41	0.15	0.07	0.04	0.03
20 to 29.9	Azusa	1.18	0.42	0.36	0.28	0.12	0.07	0.04	0.03
20 to 29.9	Banning	4.86	1.49	1.07	0.79	0.35	0.19	0.11	0.07
20 to 29.9	Burbank	1.42	0.48	0.36	0.26	0.10	0.06	0.04	0.03
20 to 29.9	Central LA	2.24	0.70	0.53	0.39	0.15	0.08	0.04	0.03
20 to 29.9	Compton	1.15	0.45	0.37	0.28	0.11	0.06	0.04	0.03
20 to 29.9	Costa Mesa	0.39	0.24	0.22	0.19	0.09	0.06	0.04	0.02
20 to 29.9	Crestline	1.34	0.46	0.34	0.26	0.11	0.06	0.04	0.02
20 to 29.9	Fontana	2.87	0.91	0.67	0.50	0.20	0.10	0.06	0.04
20 to 29.9	Indio	3.61	1.09	0.73	0.52	0.22	0.12	0.07	0.05
20 to 29.9	La Habra	0.79	0.36	0.30	0.23	0.10	0.05	0.03	0.02
20 to 29.9	Lake Elsinore	0.72	0.30	0.25	0.20	0.09	0.05	0.02	0.03
20 to 29.9	LAX	3.46	1.09	0.80	0.59	0.22	0.10	0.05	0.03
20 to 29.9	Long Beach	0.48	0.29	0.26	0.21	0.10	0.06	0.04	0.04
20 to 29.9	Lynwood	1.06	0.45	0.37	0.29	0.12	0.06	0.04	0.03
20 to 29.9	Mission Viejo	0.43	0.22	0.20	0.17	0.07	0.04	0.02	0.02
20 to 29.9	Palm Springs	3.94	1.06	0.74	0.54	0.23	0.12	0.07	0.04
20 to 29.9	Perris	1.64	0.57	0.41	0.30	0.12	0.06	0.04	0.03
20 to 29.9	Pico Rivera	2.13	0.70	0.51	0.37	0.14	0.07	0.04	0.03
20 to 29.9	Pomona	1.23	0.48	0.37	0.28	0.11	0.06	0.04	0.03
20 to 29.9	Redlands	0.40	0.25	0.24	0.20	0.10	0.06	0.04	0.04
20 to 29.9	Reseda	0.71	0.31	0.23	0.17	0.07	0.04	0.03	0.02
20 to 29.9	Riverside	1.17	0.45	0.38	0.30	0.13	0.07	0.04	0.03
20 to 29.9	San Bernardino	2.13	0.70	0.51	0.37	0.15	0.08	0.05	0.04
20 to 29.9	Santa Clarita	2.50	0.80	0.57	0.41	0.15	0.08	0.04	0.03
20 to 29.9	Upland	1.43	0.54	0.44	0.34	0.15	0.08	0.05	0.04
20 to 29.9	West LA	1.18	0.47	0.37	0.28	0.11	0.06	0.03	0.02

Table 3.15
Dispersion Factors (X/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 30 to 49.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
30 to 49.9	Anaheim	1.20	0.45	0.37	0.29	0.12	0.06	0.03	0.02
30 to 49.9	Azusa	0.63	0.22	0.21	0.19	0.09	0.05	0.03	0.02
30 to 49.9	Banning	3.39	1.04	0.77	0.58	0.25	0.14	0.09	0.05
30 to 49.9	Burbank	0.61	0.26	0.22	0.17	0.07	0.04	0.02	0.02
30 to 49.9	Central LA	1.40	0.47	0.38	0.29	0.12	0.06	0.03	0.02
30 to 49.9	Compton	0.62	0.28	0.25	0.20	0.09	0.05	0.03	0.02
30 to 49.9	Costa Mesa	0.16	0.13	0.14	0.13	0.07	0.05	0.03	0.02
30 to 49.9	Crestline	0.75	0.28	0.23	0.18	0.08	0.05	0.03	0.02
30 to 49.9	Fontana	1.74	0.58	0.46	0.36	0.15	0.08	0.04	0.03
30 to 49.9	Indio	2.48	0.76	0.52	0.38	0.15	0.09	0.05	0.04
30 to 49.9	La Habra	0.36	0.20	0.19	0.16	0.08	0.04	0.03	0.02
30 to 49.9	Lake Elsinore	0.34	0.17	0.15	0.13	0.07	0.04	0.02	0.02
30 to 49.9	LAX	2.12	0.71	0.56	0.43	0.17	0.08	0.04	0.02
30 to 49.9	Long Beach	0.20	0.16	0.17	0.15	0.08	0.04	0.03	0.02
30 to 49.9	Lynwood	0.47	0.25	0.23	0.19	0.09	0.05	0.03	0.02
30 to 49.9	Mission Viejo	0.16	0.12	0.13	0.11	0.06	0.03	0.02	0.01
30 to 49.9	Palm Springs	2.89	0.79	0.57	0.43	0.18	0.10	0.05	0.03
30 to 49.9	Perris	1.11	0.40	0.30	0.23	0.09	0.05	0.03	0.02
30 to 49.9	Pico Rivera	1.21	0.43	0.34	0.27	0.10	0.05	0.03	0.02
30 to 49.9	Pomona	0.66	0.29	0.24	0.20	0.08	0.05	0.03	0.02
30 to 49.9	Redlands	0.17	0.15	0.15	0.14	0.08	0.05	0.03	0.03
30 to 49.9	Reseda	0.44	0.21	0.17	0.13	0.06	0.03	0.02	0.01
30 to 49.9	Riverside	0.59	0.25	0.24	0.21	0.10	0.06	0.03	0.02
30 to 49.9	San Bernardino	1.28	0.44	0.34	0.27	0.11	0.06	0.03	0.03
30 to 49.9	Santa Clarita	1.80	0.60	0.45	0.33	0.12	0.06	0.03	0.02
30 to 49.9	Upland	0.67	0.28	0.26	0.23	0.11	0.06	0.03	0.02
30 to 49.9	West LA	0.58	0.27	0.24	0.20	0.09	0.05	0.02	0.01

Table 3.16
Dispersion Factors (X/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 50 to 149.9 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
50 to 149.9	Anaheim	0.01	0.05	0.08	0.10	0.07	0.05	0.02	0.01
50 to 149.9	Azusa	0.02	0.06	0.08	0.09	0.07	0.04	0.02	0.01
50 to 149.9	Banning	0.00	0.01	0.04	0.07	0.10	0.08	0.05	0.03
50 to 149.9	Burbank	0.02	0.05	0.07	0.08	0.05	0.03	0.02	0.01
50 to 149.9	Central LA	0.01	0.04	0.07	0.08	0.07	0.04	0.02	0.01
50 to 149.9	Compton	0.02	0.05	0.08	0.09	0.06	0.04	0.02	0.01
50 to 149.9	Costa Mesa	0.03	0.05	0.07	0.07	0.06	0.04	0.02	0.01
50 to 149.9	Crestline	0.02	0.05	0.07	0.07	0.05	0.03	0.02	0.01
50 to 149.9	Fontana	0.01	0.04	0.06	0.08	0.08	0.05	0.03	0.02
50 to 149.9	Indio	0.02	0.04	0.06	0.07	0.06	0.05	0.03	0.02
50 to 149.9	La Habra	0.03	0.06	0.07	0.08	0.06	0.04	0.02	0.01
50 to 149.9	Lake Elsinore	0.02	0.04	0.05	0.06	0.04	0.03	0.02	0.01
50 to 149.9	LAX	0.01	0.04	0.08	0.10	0.09	0.06	0.03	0.01
50 to 149.9	Long Beach	0.01	0.05	0.06	0.07	0.05	0.03	0.02	0.01
50 to 149.9	Lynwood	0.04	0.07	0.09	0.09	0.07	0.04	0.02	0.01
50 to 149.9	Mission Viejo	0.01	0.04	0.06	0.06	0.05	0.03	0.01	0.01
50 to 149.9	Palm Springs	0.03	0.05	0.08	0.09	0.09	0.06	0.04	0.02
50 to 149.9	Perris	0.03	0.05	0.05	0.06	0.05	0.04	0.02	0.01
50 to 149.9	Pico Rivera	0.01	0.05	0.07	0.08	0.06	0.04	0.02	0.01
50 to 149.9	Pomona	0.04	0.07	0.08	0.09	0.06	0.04	0.02	0.01
50 to 149.9	Redlands	0.04	0.06	0.08	0.08	0.06	0.04	0.02	0.02
50 to 149.9	Reseda	0.05	0.08	0.07	0.07	0.04	0.03	0.01	0.01
50 to 149.9	Riverside	0.02	0.04	0.07	0.08	0.07	0.04	0.02	0.01
50 to 149.9	San Bernardino	0.04	0.06	0.07	0.08	0.06	0.04	0.02	0.02
50 to 149.9	Santa Clarita	0.02	0.04	0.05	0.07	0.07	0.05	0.02	0.01
50 to 149.9	Upland	0.02	0.04	0.07	0.08	0.07	0.05	0.03	0.01
50 to 149.9	West LA	0.02	0.05	0.08	0.09	0.06	0.04	0.02	0.01

Table 3.17
Dispersion Factors (X/Q)
for Natural Gas Boilers
Operating More than 12 Hours per Day

Natural Gas Boiler Rating 150 to 200 MMBTU/hr

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (MMBTU/hr)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
150 to 200	Anaheim	0.01	0.02	0.03	0.05	0.05	0.03	0.02	0.01
150 to 200	Azusa	0.01	0.03	0.04	0.05	0.04	0.03	0.02	0.01
150 to 200	Banning	0.00	0.01	0.02	0.03	0.06	0.05	0.03	0.02
150 to 200	Burbank	0.01	0.03	0.04	0.04	0.03	0.02	0.01	0.01
150 to 200	Central LA	0.00	0.02	0.03	0.04	0.04	0.03	0.02	0.01
150 to 200	Compton	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01
150 to 200	Costa Mesa	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01
150 to 200	Crestline	0.01	0.02	0.03	0.04	0.03	0.02	0.01	0.01
150 to 200	Fontana	0.01	0.02	0.03	0.04	0.05	0.04	0.02	0.01
150 to 200	Indio	0.01	0.02	0.03	0.03	0.03	0.03	0.02	0.01
150 to 200	La Habra	0.01	0.03	0.04	0.04	0.04	0.03	0.01	0.01
150 to 200	Lake Elsinore	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0.01
150 to 200	LAX	0.00	0.02	0.04	0.05	0.06	0.04	0.02	0.01
150 to 200	Long Beach	0.00	0.02	0.03	0.04	0.03	0.02	0.01	0.01
150 to 200	Lynwood	0.02	0.03	0.04	0.05	0.04	0.03	0.02	0.01
150 to 200	Mission Viejo	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0.01
150 to 200	Palm Springs	0.01	0.02	0.03	0.04	0.05	0.04	0.03	0.02
150 to 200	Perris	0.01	0.02	0.03	0.03	0.03	0.03	0.01	0.01
150 to 200	Pico Rivera	0.00	0.02	0.04	0.04	0.04	0.03	0.01	0.01
150 to 200	Pomona	0.02	0.03	0.04	0.05	0.04	0.03	0.01	0.01
150 to 200	Redlands	0.01	0.03	0.04	0.04	0.04	0.03	0.02	0.01
150 to 200	Reseda	0.02	0.04	0.04	0.04	0.03	0.02	0.01	0.01
150 to 200	Riverside	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01
150 to 200	San Bernardino	0.02	0.03	0.03	0.04	0.04	0.03	0.02	0.01
150 to 200	Santa Clarita	0.01	0.02	0.02	0.03	0.04	0.03	0.02	0.01
150 to 200	Upland	0.01	0.02	0.03	0.04	0.05	0.03	0.02	0.01
150 to 200	West LA	0.01	0.03	0.04	0.05	0.04	0.03	0.02	0.01

Table 6.11

**Dispersion Factors (χ/Q)
for Natural Gas Boilers
for Acute Hazard Index**

All Operating Conditions χ/Q Values ([μg/m^3]/[lb/hr])

Rating (MMBTU/hr)	Downwind Distance (meters)							
	25	**50**	**75**	**100**	**200**	**300**	**500**	**1,000**
0 to 4.9	292.13	83.85	69.00	59.08	29.68	16.23	9.32	4.81
5 to 9.9	181.53	51.33	38.71	33.11	15.95	6.38	4.81	3.57
10 to 19.9	146.73	42.57	31.10	25.08	11.87	5.48	2.87	2.61
20 to 29.9	100.18	30.81	23.71	18.54	8.86	4.30	2.36	1.55
30 to 49.9	85.19	26.20	20.19	15.95	6.78	3.73	2.08	1.02
50 to 149.9	6.08	3.84	4.68	4.64	3.31	2.37	1.50	0.76
150 to 200	3.18	2.13	3.08	3.07	2.44	1.80	1.10	0.56

Table 2.21
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating 12 Hours per Day or Less

Natural Gas ICE Rating 50 to 74.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
50 to 74.9	Anaheim	40.29	9.05	4.79	2.80	0.57	0.20	0.06	0.02
50 to 74.9	Azusa	33.21	8.18	4.39	2.57	0.52	0.18	0.06	0.01
50 to 74.9	Banning	38.67	9.35	5.03	3.02	0.70	0.26	0.08	0.02
50 to 74.9	Burbank	27.20	6.15	3.14	1.78	0.34	0.12	0.04	0.01
50 to 74.9	Central LA	33.50	7.40	3.78	2.17	0.44	0.15	0.05	0.01
50 to 74.9	Compton	31.40	7.16	3.76	2.19	0.45	0.15	0.05	0.01
50 to 74.9	Costa Mesa	26.76	7.11	3.80	2.19	0.43	0.15	0.05	0.01
50 to 74.9	Crestline	25.75	6.27	3.25	1.84	0.36	0.13	0.04	0.01
50 to 74.9	Fontana	37.28	9.07	4.93	2.94	0.63	0.23	0.07	0.02
50 to 74.9	Indio	20.15	5.36	2.82	1.63	0.34	0.13	0.04	0.01
50 to 74.9	La Habra	29.75	7.44	3.87	2.20	0.42	0.15	0.05	0.01
50 to 74.9	Lake Elsinore	21.82	6.07	3.27	1.90	0.38	0.14	0.04	0.01
50 to 74.9	LAX	49.81	10.82	5.88	3.56	0.79	0.28	0.09	0.02
50 to 74.9	Long Beach	24.49	5.57	2.92	1.68	0.34	0.11	0.04	0.01
50 to 74.9	Lynwood	32.66	7.76	4.13	2.43	0.50	0.17	0.06	0.01
50 to 74.9	Mission Viejo	24.81	6.12	3.22	1.83	0.35	0.13	0.04	0.01
50 to 74.9	Palm Springs	18.86	4.72	2.44	1.43	0.30	0.11	0.03	0.01
50 to 74.9	Perris	19.26	5.17	2.76	1.63	0.36	0.13	0.04	0.01
50 to 74.9	Pico Rivera	35.00	7.70	4.05	2.33	0.47	0.17	0.06	0.01
50 to 74.9	Pomona	28.90	7.21	3.74	2.13	0.41	0.15	0.05	0.01
50 to 74.9	Redlands	27.45	7.62	4.00	2.26	0.44	0.16	0.05	0.01
50 to 74.9	Reseda	15.93	4.68	2.33	1.28	0.23	0.08	0.03	0.01
50 to 74.9	Riverside	32.21	7.77	4.22	2.50	0.52	0.18	0.06	0.02
50 to 74.9	San Bernardino	27.02	6.86	3.62	2.10	0.43	0.15	0.05	0.01
50 to 74.9	Santa Clarita	29.54	6.80	3.58	2.13	0.45	0.17	0.06	0.01
50 to 74.9	Upland	35.80	8.71	4.71	2.78	0.58	0.20	0.07	0.02
50 to 74.9	West LA	35.98	8.00	4.12	2.32	0.45	0.16	0.05	0.01

Table 2.22
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating 12 Hours per Day or Less

Natural Gas ICE Rating 75 to 149.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
75 to 149.9	Anaheim	27.31	7.08	4.11	2.51	0.54	0.19	0.06	0.02
75 to 149.9	Azusa	20.63	6.03	3.64	2.25	0.48	0.17	0.06	0.01
75 to 149.9	Banning	28.58	7.64	4.42	2.77	0.67	0.25	0.08	0.02
75 to 149.9	Burbank	18.08	4.75	2.68	1.59	0.32	0.11	0.04	0.01
75 to 149.9	Central LA	23.51	5.92	3.31	1.97	0.41	0.14	0.05	0.01
75 to 149.9	Compton	20.66	5.49	3.19	1.94	0.42	0.14	0.05	0.01
75 to 149.9	Costa Mesa	15.84	5.11	3.12	1.91	0.40	0.14	0.05	0.01
75 to 149.9	Crestline	16.22	4.65	2.68	1.60	0.33	0.12	0.04	0.01
75 to 149.9	Fontana	25.22	6.93	4.16	2.61	0.59	0.22	0.07	0.02
75 to 149.9	Indio	12.86	3.98	2.34	1.43	0.32	0.12	0.04	0.01
75 to 149.9	La Habra	18.26	5.47	3.19	1.91	0.39	0.14	0.05	0.01
75 to 149.9	Lake Elsinore	12.79	4.20	2.56	1.58	0.35	0.13	0.04	0.01
75 to 149.9	LAX	35.20	8.58	5.08	3.21	0.75	0.27	0.09	0.02
75 to 149.9	Long Beach	16.07	4.27	2.43	1.47	0.32	0.11	0.04	0.01
75 to 149.9	Lynwood	20.44	5.70	3.40	2.11	0.46	0.16	0.05	0.01
75 to 149.9	Mission Viejo	15.37	4.47	2.64	1.59	0.33	0.12	0.04	0.01
75 to 149.9	Palm Springs	12.73	3.63	2.04	1.25	0.28	0.10	0.03	0.01
75 to 149.9	Perris	13.18	3.92	2.30	1.43	0.34	0.13	0.04	0.01
75 to 149.9	Pico Rivera	24.04	6.03	3.47	2.09	0.44	0.16	0.05	0.01
75 to 149.9	Pomona	18.46	5.39	3.12	1.87	0.38	0.14	0.05	0.01
75 to 149.9	Redlands	15.53	5.31	3.20	1.94	0.40	0.15	0.05	0.01
75 to 149.9	Reseda	8.79	3.06	1.73	1.01	0.21	0.08	0.03	0.01
75 to 149.9	Riverside	20.30	5.74	3.49	2.19	0.49	0.18	0.06	0.02
75 to 149.9	San Bernardino	17.20	5.06	2.97	1.82	0.40	0.15	0.05	0.01
75 to 149.9	Santa Clarita	22.35	5.61	3.15	1.95	0.44	0.16	0.06	0.01
75 to 149.9	Upland	22.84	6.42	3.91	2.44	0.54	0.19	0.07	0.02
75 to 149.9	West LA	24.12	6.19	3.51	2.08	0.42	0.16	0.05	0.01

Table 2.23
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating 12 Hours per Day or Less

Natural Gas ICE Rating 150 to 249.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
150 to 249.9	Anaheim	15.44	4.56	2.82	1.92	0.47	0.17	0.06	0.02
150 to 249.9	Azusa	10.29	3.48	2.27	1.59	0.41	0.15	0.05	0.01
150 to 249.9	Banning	19.58	5.46	3.27	2.24	0.61	0.23	0.08	0.02
150 to 249.9	Burbank	9.61	3.01	1.81	1.19	0.27	0.10	0.03	0.01
150 to 249.9	Central LA	14.53	4.06	2.40	1.57	0.37	0.13	0.04	0.01
150 to 249.9	Compton	11.56	3.48	2.17	1.46	0.36	0.13	0.04	0.01
150 to 249.9	Costa Mesa	7.21	2.81	1.88	1.32	0.33	0.13	0.05	0.01
150 to 249.9	Crestline	8.01	2.74	1.70	1.14	0.28	0.11	0.04	0.01
150 to 249.9	Fontana	14.98	4.42	2.79	1.96	0.51	0.19	0.07	0.02
150 to 249.9	Indio	6.91	2.39	1.52	1.05	0.27	0.11	0.04	0.01
150 to 249.9	La Habra	8.86	3.16	1.99	1.35	0.32	0.12	0.04	0.01
150 to 249.9	Lake Elsinore	5.83	2.13	1.43	1.02	0.28	0.11	0.04	0.01
150 to 249.9	LAX	22.40	5.91	3.65	2.54	0.67	0.24	0.08	0.02
150 to 249.9	Long Beach	8.47	2.75	1.67	1.09	0.27	0.10	0.03	0.01
150 to 249.9	Lynwood	10.64	3.41	2.20	1.53	0.39	0.14	0.05	0.01
150 to 249.9	Mission Viejo	7.36	2.52	1.61	1.10	0.27	0.11	0.04	0.01
150 to 249.9	Palm Springs	7.92	2.38	1.44	0.96	0.24	0.09	0.03	0.01
150 to 249.9	Perris	8.11	2.54	1.57	1.08	0.29	0.12	0.04	0.01
150 to 249.9	Pico Rivera	14.02	4.00	2.41	1.60	0.38	0.14	0.05	0.01
150 to 249.9	Pomona	9.57	3.26	2.03	1.36	0.32	0.12	0.04	0.01
150 to 249.9	Redlands	6.64	2.72	1.82	1.29	0.33	0.13	0.05	0.01
150 to 249.9	Reseda	5.01	1.71	1.04	0.69	0.17	0.07	0.02	0.01
150 to 249.9	Riverside	10.68	3.40	2.24	1.59	0.42	0.16	0.06	0.01
150 to 249.9	San Bernardino	9.41	3.07	1.93	1.33	0.34	0.13	0.05	0.01
150 to 249.9	Santa Clarita	15.90	4.23	2.45	1.62	0.40	0.15	0.05	0.01
150 to 249.9	Upland	12.09	3.82	2.49	1.77	0.46	0.17	0.06	0.02
150 to 249.9	West LA	13.12	3.98	2.40	1.58	0.36	0.14	0.05	0.01

Table 2.24
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating 12 Hours per Day or Less

Natural Gas ICE Rating 250 to 999.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([$\mu g/m^3$]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
250 to 999.9	Anaheim	8.73	2.83	1.91	1.30	0.38	0.15	0.05	0.01
250 to 999.9	Azusa	5.03	1.99	1.43	1.00	0.31	0.13	0.05	0.01
250 to 999.9	Banning	12.24	3.70	2.37	1.62	0.52	0.20	0.07	0.02
250 to 999.9	Burbank	5.01	1.77	1.18	0.78	0.21	0.08	0.03	0.01
250 to 999.9	Central LA	8.67	2.62	1.69	1.12	0.31	0.11	0.04	0.01
250 to 999.9	Compton	6.25	2.15	1.47	1.00	0.29	0.11	0.04	0.01
250 to 999.9	Costa Mesa	3.20	1.50	1.12	0.80	0.26	0.11	0.04	0.01
250 to 999.9	Crestline	4.03	1.54	1.05	0.72	0.22	0.09	0.03	0.01
250 to 999.9	Fontana	8.73	2.77	1.88	1.31	0.42	0.17	0.06	0.02
250 to 999.9	Indio	3.81	1.41	0.98	0.69	0.22	0.09	0.03	0.01
250 to 999.9	La Habra	4.32	1.75	1.22	0.84	0.25	0.11	0.04	0.01
250 to 999.9	Lake Elsinore	2.93	1.15	0.85	0.62	0.22	0.09	0.04	0.01
250 to 999.9	LAX	13.74	3.96	2.62	1.81	0.56	0.22	0.08	0.02
250 to 999.9	Long Beach	4.22	1.62	1.09	0.72	0.22	0.08	0.03	0.01
250 to 999.9	Lynwood	5.58	2.08	1.46	1.02	0.31	0.12	0.05	0.01
250 to 999.9	Mission Viejo	3.49	1.35	0.96	0.67	0.21	0.09	0.04	0.01
250 to 999.9	Palm Springs	5.01	1.56	1.02	0.69	0.20	0.08	0.03	0.01
250 to 999.9	Perris	5.04	1.65	1.09	0.76	0.24	0.10	0.04	0.01
250 to 999.9	Pico Rivera	8.05	2.52	1.64	1.09	0.31	0.13	0.05	0.01
250 to 999.9	Pomona	5.07	1.95	1.33	0.90	0.26	0.10	0.04	0.01
250 to 999.9	Redlands	2.86	1.41	1.07	0.77	0.25	0.11	0.04	0.01
250 to 999.9	Reseda	2.95	1.10	0.72	0.49	0.14	0.06	0.02	0.01
250 to 999.9	Riverside	5.58	2.02	1.45	1.03	0.33	0.14	0.05	0.01
250 to 999.9	San Bernardino	5.29	1.85	1.27	0.88	0.27	0.11	0.04	0.01
250 to 999.9	Santa Clarita	10.48	3.01	1.85	1.23	0.34	0.14	0.05	0.01
250 to 999.9	Upland	6.27	2.24	1.61	1.14	0.36	0.15	0.05	0.01
250 to 999.9	West LA	7.08	2.45	1.61	1.06	0.29	0.12	0.05	0.01

Table 2.25
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating 12 Hours per Day or Less

Natural Gas ICE Rating > 1,000 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([$\mu g/m^3$]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
> 1,000	Anaheim	1.18	0.51	0.47	0.41	0.18	0.10	0.04	0.01
> 1,000	Azusa	0.42	0.29	0.29	0.27	0.14	0.08	0.04	0.01
> 1,000	Banning	3.47	1.14	0.90	0.73	0.29	0.14	0.06	0.02
> 1,000	Burbank	0.43	0.27	0.26	0.22	0.11	0.06	0.02	0.01
> 1,000	Central LA	1.82	0.68	0.57	0.46	0.17	0.08	0.03	0.01
> 1,000	Compton	0.95	0.43	0.40	0.33	0.14	0.07	0.03	0.01
> 1,000	Costa Mesa	0.22	0.19	0.21	0.20	0.12	0.07	0.03	0.01
> 1,000	Crestline	0.53	0.28	0.26	0.23	0.11	0.06	0.03	0.01
> 1,000	Fontana	1.71	0.64	0.55	0.47	0.21	0.11	0.05	0.01
> 1,000	Indio	0.65	0.29	0.26	0.23	0.11	0.06	0.03	0.01
> 1,000	La Habra	0.39	0.25	0.25	0.23	0.12	0.07	0.03	0.01
> 1,000	Lake Elsinore	0.37	0.21	0.21	0.19	0.10	0.06	0.03	0.01
> 1,000	LAX	2.90	1.02	0.87	0.72	0.29	0.15	0.06	0.02
> 1,000	Long Beach	0.35	0.25	0.25	0.22	0.10	0.06	0.02	0.01
> 1,000	Lynwood	0.58	0.34	0.32	0.28	0.14	0.08	0.04	0.01
> 1,000	Mission Viejo	0.21	0.17	0.19	0.17	0.10	0.06	0.03	0.01
> 1,000	Palm Springs	1.49	0.52	0.41	0.32	0.12	0.06	0.02	0.01
> 1,000	Perris	1.27	0.48	0.39	0.31	0.13	0.07	0.03	0.01
> 1,000	Pico Rivera	1.37	0.56	0.48	0.39	0.16	0.09	0.04	0.01
> 1,000	Pomona	0.65	0.34	0.32	0.27	0.13	0.07	0.03	0.01
> 1,000	Redlands	0.22	0.21	0.22	0.21	0.12	0.07	0.03	0.01
> 1,000	Reseda	0.65	0.32	0.26	0.21	0.08	0.04	0.02	0.01
> 1,000	Riverside	0.65	0.32	0.32	0.29	0.16	0.09	0.04	0.01
> 1,000	San Bernardino	0.93	0.40	0.36	0.30	0.14	0.08	0.03	0.01
> 1,000	Santa Clarita	3.40	1.14	0.83	0.63	0.21	0.10	0.04	0.01
> 1,000	Upland	0.67	0.34	0.34	0.31	0.17	0.09	0.04	0.01
> 1,000	West LA	0.71	0.37	0.35	0.31	0.15	0.08	0.04	0.01

Table 3.21
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating More Than 12 Hours per Day

Natural Gas ICE Rating 50 to 74.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
50 to 74.9	Anaheim	27.98	8.27	5.36	3.96	1.41	0.57	0.21	0.07
50 to 74.9	Azusa	26.00	8.04	5.60	4.27	1.61	0.62	0.21	0.07
50 to 74.9	Banning	44.67	13.52	8.61	6.07	2.18	0.94	0.36	0.12
50 to 74.9	Burbank	26.88	8.25	5.56	4.19	1.48	0.54	0.18	0.06
50 to 74.9	Central LA	24.03	7.22	4.84	3.64	1.26	0.45	0.15	0.05
50 to 74.9	Compton	23.38	6.91	5.09	4.10	1.64	0.61	0.20	0.07
50 to 74.9	Costa Mesa	14.34	4.42	3.08	2.40	1.02	0.48	0.20	0.07
50 to 74.9	Crestline	18.37	5.54	3.58	2.63	1.00	0.46	0.19	0.07
50 to 74.9	Fontana	31.64	9.78	6.48	4.78	1.80	0.77	0.29	0.10
50 to 74.9	Indio	32.25	10.57	6.96	5.11	1.95	0.84	0.33	0.11
50 to 74.9	La Habra	16.70	4.85	3.23	2.48	0.99	0.46	0.19	0.07
50 to 74.9	Lake Elsinore	13.01	4.88	3.59	2.90	1.29	0.58	0.24	0.08
50 to 74.9	LAX	31.62	8.62	5.60	4.10	1.49	0.62	0.23	0.08
50 to 74.9	Long Beach	20.14	6.90	5.22	4.28	1.74	0.62	0.20	0.07
50 to 74.9	Lynwood	22.12	6.49	4.63	3.63	1.47	0.60	0.22	0.08
50 to 74.9	Mission Viejo	17.44	5.23	3.54	2.71	1.14	0.50	0.20	0.07
50 to 74.9	Palm Springs	30.66	9.41	6.13	4.52	1.60	0.64	0.24	0.08
50 to 74.9	Perris	16.92	5.55	3.76	2.87	1.19	0.56	0.24	0.08
50 to 74.9	Pico Rivera	27.98	7.89	5.11	3.70	1.29	0.52	0.20	0.07
50 to 74.9	Pomona	19.82	6.02	4.41	3.58	1.57	0.63	0.23	0.08
50 to 74.9	Redlands	16.34	5.28	3.61	2.89	1.67	0.78	0.32	0.12
50 to 74.9	Reseda	9.73	3.27	2.55	2.17	0.97	0.43	0.17	0.06
50 to 74.9	Riverside	22.31	6.53	4.47	3.41	1.36	0.59	0.23	0.08
50 to 74.9	San Bernardino	24.70	8.03	5.34	4.01	1.57	0.69	0.28	0.10
50 to 74.9	Santa Clarita	23.23	6.39	4.16	3.08	1.30	0.55	0.21	0.07
50 to 74.9	Upland	26.12	7.72	5.25	4.22	1.77	0.74	0.31	0.11
50 to 74.9	West LA	18.92	5.02	3.22	2.39	1.03	0.45	0.18	0.06

Table 3.22
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating More Than 12 Hours per Day

Natural Gas ICE Rating 75 to 149.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
75 to 149.9	Anaheim	17.43	5.01	3.21	2.27	0.85	0.41	0.19	0.07
75 to 149.9	Azusa	15.57	4.59	3.19	2.39	0.99	0.46	0.20	0.08
75 to 149.9	Banning	32.03	9.58	6.26	4.49	1.72	0.80	0.34	0.12
75 to 149.9	Burbank	16.98	4.93	3.33	2.47	0.99	0.43	0.18	0.07
75 to 149.9	Central LA	16.20	4.24	2.90	2.21	0.88	0.37	0.15	0.06
75 to 149.9	Compton	13.93	3.83	2.65	2.00	0.90	0.43	0.19	0.08
75 to 149.9	Costa Mesa	7.82	2.52	1.68	1.19	0.53	0.31	0.16	0.06
75 to 149.9	Crestline	11.63	3.54	2.24	1.56	0.60	0.31	0.16	0.07
75 to 149.9	Fontana	20.70	6.23	4.16	3.02	1.18	0.57	0.26	0.10
75 to 149.9	Indio	21.58	7.01	4.68	3.42	1.36	0.65	0.29	0.11
75 to 149.9	La Habra	9.74	2.91	1.85	1.29	0.53	0.30	0.15	0.06
75 to 149.9	Lake Elsinore	7.50	2.40	1.59	1.20	0.60	0.35	0.19	0.08
75 to 149.9	LAX	21.36	5.76	3.73	2.65	0.99	0.46	0.20	0.08
75 to 149.9	Long Beach	11.43	3.54	2.55	2.01	0.96	0.45	0.20	0.08
75 to 149.9	Lynwood	13.15	3.70	2.52	1.86	0.81	0.41	0.20	0.08
75 to 149.9	Mission Viejo	9.49	2.77	1.79	1.27	0.54	0.31	0.16	0.06
75 to 149.9	Palm Springs	20.50	6.07	3.92	2.83	1.06	0.49	0.22	0.09
75 to 149.9	Perris	10.68	3.37	2.20	1.58	0.67	0.37	0.19	0.07
75 to 149.9	Pico Rivera	18.22	4.97	3.19	2.26	0.84	0.40	0.18	0.07
75 to 149.9	Pomona	11.86	3.45	2.29	1.69	0.83	0.44	0.22	0.09
75 to 149.9	Redlands	9.00	3.01	2.03	1.46	0.63	0.43	0.28	0.12
75 to 149.9	Reseda	5.90	1.78	1.11	0.77	0.40	0.26	0.14	0.06
75 to 149.9	Riverside	13.30	3.81	2.58	1.88	0.77	0.40	0.19	0.07
75 to 149.9	San Bernardino	15.60	4.88	3.20	2.34	0.96	0.48	0.23	0.09
75 to 149.9	Santa Clarita	16.08	4.29	2.63	1.85	0.71	0.37	0.18	0.07
75 to 149.9	Upland	16.23	4.63	3.13	2.29	0.99	0.49	0.27	0.11
75 to 149.9	West LA	11.88	3.20	1.97	1.31	0.50	0.27	0.15	0.06

Table 3.23
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating More Than 12 Hours per Day

Natural Gas ICE Rating 150 to 249.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
150 to 249.9	Anaheim	8.91	2.64	1.59	1.16	0.40	0.18	0.11	0.05
150 to 249.9	Azusa	7.03	2.10	1.37	1.04	0.40	0.19	0.12	0.06
150 to 249.9	Banning	20.47	5.78	3.45	2.56	1.05	0.52	0.25	0.10
150 to 249.9	Burbank	8.41	2.41	1.43	1.07	0.44	0.20	0.11	0.06
150 to 249.9	Central LA	9.23	2.39	1.47	1.07	0.40	0.18	0.10	0.05
150 to 249.9	Compton	6.68	1.89	1.22	0.91	0.35	0.17	0.11	0.06
150 to 249.9	Costa Mesa	3.26	1.21	0.81	0.60	0.21	0.11	0.08	0.04
150 to 249.9	Crestline	5.97	1.88	1.12	0.81	0.29	0.14	0.08	0.04
150 to 249.9	Fontana	11.47	3.34	2.05	1.52	0.56	0.26	0.15	0.08
150 to 249.9	Indio	12.59	3.92	2.36	1.77	0.70	0.33	0.18	0.09
150 to 249.9	La Habra	4.50	1.49	0.93	0.66	0.21	0.11	0.08	0.04
150 to 249.9	Lake Elsinore	3.44	1.13	0.74	0.55	0.20	0.11	0.08	0.05
150 to 249.9	LAX	12.44	3.32	2.03	1.48	0.50	0.23	0.12	0.06
150 to 249.9	Long Beach	4.96	1.57	1.03	0.79	0.34	0.17	0.12	0.06
150 to 249.9	Lynwood	6.16	1.83	1.18	0.88	0.32	0.16	0.11	0.06
150 to 249.9	Mission Viejo	3.88	1.21	0.75	0.54	0.18	0.10	0.07	0.04
150 to 249.9	Palm Springs	12.51	3.53	2.10	1.55	0.58	0.25	0.14	0.07
150 to 249.9	Perris	6.07	1.88	1.14	0.83	0.30	0.15	0.10	0.05
150 to 249.9	Pico Rivera	9.74	2.69	1.57	1.14	0.40	0.18	0.11	0.05
150 to 249.9	Pomona	5.58	1.75	1.08	0.78	0.26	0.15	0.11	0.07
150 to 249.9	Redlands	3.59	1.34	0.90	0.68	0.24	0.13	0.12	0.08
150 to 249.9	Reseda	3.34	1.01	0.61	0.43	0.14	0.07	0.07	0.04
150 to 249.9	Riverside	6.33	1.87	1.22	0.91	0.32	0.16	0.10	0.05
150 to 249.9	San Bernardino	8.40	2.53	1.52	1.13	0.44	0.21	0.13	0.07
150 to 249.9	Santa Clarita	9.98	2.65	1.51	1.06	0.34	0.16	0.10	0.05
150 to 249.9	Upland	7.96	2.29	1.46	1.11	0.41	0.20	0.13	0.08
150 to 249.9	West LA	5.94	1.77	1.07	0.74	0.22	0.11	0.07	0.04

Table 3.24
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating More Than 12 Hours per Day

Natural Gas ICE Rating 250 to 999.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
250 to 999.9	Anaheim	4.77	1.49	0.96	0.65	0.22	0.10	0.05	0.03
250 to 999.9	Azusa	3.36	1.10	0.77	0.54	0.21	0.10	0.05	0.04
250 to 999.9	Banning	12.33	3.53	2.13	1.43	0.62	0.32	0.17	0.08
250 to 999.9	Burbank	4.34	1.27	0.78	0.52	0.21	0.10	0.05	0.04
250 to 999.9	Central LA	5.18	1.41	0.93	0.64	0.23	0.10	0.05	0.03
250 to 999.9	Compton	3.28	1.05	0.72	0.51	0.19	0.09	0.05	0.04
250 to 999.9	Costa Mesa	1.41	0.63	0.47	0.34	0.13	0.06	0.04	0.03
250 to 999.9	Crestline	3.21	1.03	0.65	0.44	0.16	0.08	0.04	0.03
250 to 999.9	Fontana	6.56	1.93	1.23	0.84	0.32	0.15	0.08	0.05
250 to 999.9	Indio	7.67	2.32	1.39	0.93	0.39	0.19	0.10	0.06
250 to 999.9	La Habra	2.15	0.79	0.54	0.37	0.13	0.06	0.04	0.03
250 to 999.9	Lake Elsinore	1.74	0.60	0.42	0.31	0.12	0.06	0.03	0.03
250 to 999.9	LAX	7.32	2.05	1.31	0.90	0.32	0.13	0.07	0.04
250 to 999.9	Long Beach	2.20	0.82	0.59	0.42	0.17	0.08	0.05	0.04
250 to 999.9	Lynwood	3.06	1.03	0.72	0.51	0.18	0.08	0.05	0.04
250 to 999.9	Mission Viejo	1.68	0.59	0.41	0.29	0.10	0.05	0.03	0.02
250 to 999.9	Palm Springs	7.89	2.15	1.31	0.90	0.36	0.16	0.08	0.05
250 to 999.9	Perris	3.57	1.12	0.70	0.47	0.17	0.08	0.05	0.03
250 to 999.9	Pico Rivera	5.30	1.53	0.93	0.62	0.22	0.09	0.05	0.03
250 to 999.9	Pomona	2.88	0.99	0.66	0.45	0.15	0.07	0.05	0.04
250 to 999.9	Redlands	1.51	0.67	0.50	0.37	0.14	0.07	0.05	0.05
250 to 999.9	Reseda	1.94	0.61	0.39	0.26	0.09	0.05	0.03	0.02
250 to 999.9	Riverside	3.20	1.03	0.72	0.52	0.19	0.09	0.05	0.03
250 to 999.9	San Bernardino	4.75	1.44	0.90	0.61	0.23	0.11	0.06	0.04
250 to 999.9	Santa Clarita	6.15	1.70	1.01	0.67	0.22	0.10	0.05	0.03
250 to 999.9	Upland	4.02	1.25	0.86	0.61	0.23	0.11	0.06	0.04
250 to 999.9	West LA	3.03	1.02	0.67	0.45	0.14	0.06	0.03	0.03

Table 3.25
Dispersion Factors (χ/Q)
for Natural Gas ICEs
Operating More Than 12 Hours per Day

Natural Gas ICE Rating > 1,000 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
> 1,000	Anaheim	0.48	0.21	0.19	0.17	0.08	0.04	0.02	0.01
> 1,000	Azusa	0.34	0.12	0.12	0.11	0.06	0.04	0.02	0.01
> 1,000	Banning	2.80	0.83	0.59	0.45	0.18	0.11	0.06	0.03
> 1,000	Burbank	0.25	0.13	0.12	0.10	0.05	0.03	0.02	0.01
> 1,000	Central LA	0.90	0.31	0.26	0.21	0.09	0.05	0.02	0.01
> 1,000	Compton	0.41	0.18	0.17	0.14	0.07	0.04	0.02	0.01
> 1,000	Costa Mesa	0.11	0.08	0.08	0.08	0.05	0.03	0.02	0.01
> 1,000	Crestline	0.41	0.16	0.13	0.11	0.05	0.03	0.02	0.01
> 1,000	Fontana	1.09	0.36	0.29	0.24	0.11	0.06	0.03	0.02
> 1,000	Indio	1.67	0.52	0.35	0.26	0.10	0.06	0.04	0.02
> 1,000	La Habra	0.17	0.11	0.10	0.09	0.05	0.03	0.02	0.01
> 1,000	Lake Elsinore	0.17	0.09	0.09	0.08	0.04	0.03	0.01	0.01
> 1,000	LAX	1.29	0.43	0.36	0.30	0.13	0.06	0.03	0.01
> 1,000	Long Beach	0.18	0.12	0.12	0.10	0.05	0.03	0.02	0.01
> 1,000	Lynwood	0.25	0.14	0.13	0.12	0.06	0.04	0.02	0.01
> 1,000	Mission Viejo	0.09	0.07	0.07	0.07	0.04	0.03	0.01	0.01
> 1,000	Palm Springs	2.03	0.57	0.41	0.31	0.13	0.07	0.04	0.02
> 1,000	Perris	0.72	0.26	0.19	0.15	0.06	0.04	0.02	0.01
> 1,000	Pico Rivera	0.67	0.26	0.21	0.17	0.07	0.04	0.02	0.01
> 1,000	Pomona	0.30	0.15	0.14	0.12	0.06	0.03	0.02	0.01
> 1,000	Redlands	0.10	0.09	0.09	0.09	0.05	0.03	0.02	0.02
> 1,000	Reseda	0.37	0.15	0.12	0.09	0.04	0.02	0.01	0.01
> 1,000	Riverside	0.33	0.15	0.14	0.13	0.07	0.04	0.02	0.01
> 1,000	San Bernardino	0.71	0.25	0.21	0.17	0.08	0.04	0.02	0.01
> 1,000	Santa Clarita	1.60	0.52	0.37	0.28	0.10	0.05	0.03	0.01
> 1,000	Upland	0.35	0.15	0.15	0.14	0.07	0.04	0.02	0.01
> 1,000	West LA	0.27	0.14	0.13	0.12	0.06	0.03	0.02	0.01

Table 6.21
Dispersion Factors (χ/Q)
for Natural Gas ICEs
for Acute Hazard Index

All Operating Conditions χ/Q Values ([μg/m^3]/[lb/hr])

Rating (BHP)	Downwind Distance (meters)							
	25	50	75	100	200	300	500	1,000
50 to 74.9	558.90	228.36	182.22	152.76	73.10	30.68	12.54	5.35
75 to 149.9	392.20	153.94	125.57	105.40	50.44	22.35	9.71	4.80
150 to 249.9	281.14	85.26	60.25	51.99	25.47	9.27	4.74	3.36
250 to 999.9	193.22	54.00	37.73	27.66	11.86	6.43	3.13	1.91
> 1,000	80.72	25.42	18.44	14.10	5.27	3.36	1.92	0.87

Table 2.31
Dispersion Factors (X/Q)
for Diesel ICEs
Operating 12 Hours per Day or Less

Diesel ICE Rating 50 to 174.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
50 to 174.9	Anaheim	25.17	8.13	4.84	2.99	0.61	0.19	0.06	0.02
50 to 174.9	Azusa	18.42	6.32	3.96	2.49	0.52	0.17	0.05	0.01
50 to 174.9	Banning	27.44	7.84	4.66	2.96	0.71	0.25	0.08	0.02
50 to 174.9	Burbank	17.44	5.47	3.13	1.86	0.35	0.11	0.03	0.01
50 to 174.9	Central LA	22.15	7.03	4.00	2.40	0.48	0.14	0.04	0.01
50 to 174.9	Compton	18.88	6.34	3.80	2.35	0.49	0.15	0.04	0.01
50 to 174.9	Costa Mesa	14.14	5.24	3.33	2.06	0.42	0.14	0.05	0.01
50 to 174.9	Crestline	15.35	5.07	2.97	1.78	0.35	0.12	0.04	0.01
50 to 174.9	Fontana	23.51	7.09	4.38	2.78	0.62	0.22	0.07	0.02
50 to 174.9	Indio	11.98	3.98	2.40	1.49	0.33	0.12	0.04	0.01
50 to 174.9	La Habra	16.66	6.11	3.66	2.21	0.42	0.14	0.04	0.01
50 to 174.9	Lake Elsinore	11.80	4.15	2.61	1.64	0.35	0.13	0.04	0.01
50 to 174.9	LAX	32.85	8.89	5.41	3.46	0.80	0.27	0.09	0.02
50 to 174.9	Long Beach	15.30	4.84	2.80	1.70	0.35	0.11	0.03	0.01
50 to 174.9	Lynwood	18.12	6.16	3.82	2.41	0.51	0.16	0.05	0.01
50 to 174.9	Mission Viejo	14.38	4.59	2.78	1.68	0.33	0.12	0.04	0.01
50 to 174.9	Palm Springs	11.59	3.79	2.20	1.36	0.30	0.10	0.03	0.01
50 to 174.9	Perris	12.40	3.93	2.36	1.49	0.34	0.13	0.04	0.01
50 to 174.9	Pico Rivera	22.72	6.57	3.85	2.32	0.47	0.16	0.05	0.01
50 to 174.9	Pomona	16.77	6.00	3.57	2.16	0.42	0.13	0.04	0.01
50 to 174.9	Redlands	13.68	5.29	3.33	2.05	0.42	0.14	0.05	0.01
50 to 174.9	Reseda	7.82	3.13	1.84	1.08	0.21	0.07	0.03	0.01
50 to 174.9	Riverside	18.25	5.88	3.72	2.37	0.52	0.18	0.06	0.02
50 to 174.9	San Bernardino	15.83	5.21	3.15	1.96	0.42	0.15	0.05	0.01
50 to 174.9	Santa Clarita	21.69	5.97	3.41	2.12	0.46	0.16	0.06	0.01
50 to 174.9	Upland	20.72	6.73	4.24	2.68	0.57	0.19	0.06	0.02
50 to 174.9	West LA	22.63	6.93	4.02	2.38	0.45	0.15	0.05	0.01

Table 2.32
Dispersion Factors (X/Q)
for Diesel ICEs
Operating 12 Hours per Day or Less

Diesel ICE Rating 175 to 299.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
175 to 299.9	Anaheim	20.49	6.83	4.25	2.73	0.58	0.18	0.06	0.02
175 to 299.9	Azusa	14.27	5.02	3.31	2.19	0.49	0.16	0.05	0.01
175 to 299.9	Banning	23.38	6.77	4.15	2.73	0.68	0.24	0.08	0.02
175 to 299.9	Burbank	13.67	4.56	2.73	1.69	0.33	0.10	0.03	0.01
175 to 299.9	Central LA	18.49	6.03	3.56	2.21	0.45	0.14	0.04	0.01
175 to 299.9	Compton	15.03	5.21	3.26	2.08	0.45	0.14	0.04	0.01
175 to 299.9	Costa Mesa	10.56	4.08	2.74	1.79	0.38	0.13	0.05	0.01
175 to 299.9	Crestline	11.60	4.06	2.50	1.58	0.33	0.11	0.04	0.01
175 to 299.9	Fontana	19.05	5.86	3.77	2.51	0.59	0.21	0.07	0.02
175 to 299.9	Indio	9.24	3.18	2.03	1.32	0.31	0.11	0.04	0.01
175 to 299.9	La Habra	13.01	4.93	3.11	1.98	0.40	0.13	0.04	0.01
175 to 299.9	Lake Elsinore	8.71	3.13	2.11	1.42	0.33	0.12	0.04	0.01
175 to 299.9	LAX	27.11	7.55	4.75	3.16	0.76	0.26	0.09	0.02
175 to 299.9	Long Beach	11.85	4.00	2.41	1.49	0.32	0.10	0.03	0.01
175 to 299.9	Lynwood	14.39	5.00	3.26	2.15	0.48	0.15	0.05	0.01
175 to 299.9	Mission Viejo	10.68	3.55	2.25	1.43	0.30	0.11	0.04	0.01
175 to 299.9	Palm Springs	9.74	3.20	1.93	1.24	0.28	0.10	0.03	0.01
175 to 299.9	Perris	10.08	3.25	2.02	1.33	0.33	0.12	0.04	0.01
175 to 299.9	Pico Rivera	18.31	5.50	3.33	2.09	0.44	0.15	0.05	0.01
175 to 299.9	Pomona	13.26	4.90	3.05	1.93	0.39	0.12	0.04	0.01
175 to 299.9	Redlands	10.07	3.97	2.65	1.73	0.38	0.13	0.05	0.01
175 to 299.9	Reseda	6.27	2.26	1.43	0.89	0.19	0.07	0.02	0.01
175 to 299.9	Riverside	14.32	4.68	3.12	2.09	0.49	0.17	0.06	0.02
175 to 299.9	San Bernardino	12.55	4.25	2.70	1.76	0.39	0.14	0.05	0.01
175 to 299.9	Santa Clarita	18.94	5.30	3.09	1.97	0.44	0.16	0.06	0.01
175 to 299.9	Upland	16.22	5.39	3.57	2.37	0.54	0.18	0.06	0.02
175 to 299.9	West LA	17.69	5.69	3.44	2.13	0.42	0.14	0.05	0.01

Table 2.33
Dispersion Factors (X/Q)
for Diesel ICEs
Operating 12 Hours per Day or Less

Diesel ICE Rating 300 to 399.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
300 to 399.9	Anaheim	14.25	5.23	3.24	2.21	0.51	0.16	0.05	0.01
300 to 399.9	Azusa	9.36	3.72	2.43	1.72	0.42	0.14	0.05	0.01
300 to 399.9	Banning	17.29	5.41	3.29	2.30	0.63	0.23	0.08	0.02
300 to 399.9	Burbank	9.31	3.47	2.06	1.35	0.28	0.09	0.03	0.01
300 to 399.9	Central LA	13.43	4.80	2.83	1.86	0.41	0.12	0.04	0.01
300 to 399.9	Compton	10.52	3.99	2.50	1.71	0.41	0.12	0.04	0.01
300 to 399.9	Costa Mesa	6.71	2.96	1.97	1.39	0.34	0.12	0.04	0.01
300 to 399.9	Crestline	7.60	2.95	1.80	1.20	0.28	0.10	0.03	0.01
300 to 399.9	Fontana	13.50	4.48	2.84	2.01	0.53	0.19	0.06	0.02
300 to 399.9	Indio	6.33	2.33	1.49	1.04	0.27	0.10	0.04	0.01
300 to 399.9	La Habra	8.29	3.53	2.22	1.50	0.33	0.11	0.04	0.01
300 to 399.9	Lake Elsinore	5.39	2.08	1.39	1.01	0.28	0.10	0.04	0.01
300 to 399.9	LAX	19.98	6.01	3.75	2.64	0.70	0.24	0.08	0.02
300 to 399.9	Long Beach	8.11	3.10	1.87	1.22	0.29	0.09	0.03	0.01
300 to 399.9	Lynwood	9.59	3.72	2.41	1.70	0.42	0.13	0.05	0.01
300 to 399.9	Mission Viejo	6.92	2.55	1.62	1.11	0.26	0.10	0.04	0.01
300 to 399.9	Palm Springs	7.03	2.45	1.49	1.00	0.25	0.09	0.03	0.01
300 to 399.9	Perris	7.31	2.48	1.54	1.07	0.29	0.11	0.04	0.01
300 to 399.9	Pico Rivera	13.01	4.30	2.58	1.71	0.39	0.13	0.05	0.01
300 to 399.9	Pomona	8.82	3.64	2.26	1.52	0.34	0.11	0.04	0.01
300 to 399.9	Redlands	6.06	2.78	1.87	1.33	0.33	0.12	0.04	0.01
300 to 399.9	Reseda	4.33	1.65	1.01	0.68	0.16	0.06	0.02	0.01
300 to 399.9	Riverside	9.56	3.49	2.31	1.66	0.43	0.15	0.05	0.01
300 to 399.9	San Bernardino	8.58	3.13	1.98	1.37	0.34	0.12	0.04	0.01
300 to 399.9	Santa Clarita	14.36	4.36	2.55	1.71	0.41	0.15	0.05	0.01
300 to 399.9	Upland	10.94	4.02	2.64	1.89	0.47	0.16	0.06	0.02
300 to 399.9	West LA	12.30	4.41	2.65	1.74	0.37	0.13	0.04	0.01

Table 2.34
Dispersion Factors (X/Q)
for Diesel ICEs
Operating 12 Hours per Day or Less

Diesel ICE Rating 400 to 599.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
400 to 599.9	Anaheim	9.93	3.83	2.50	1.68	0.44	0.14	0.05	0.01
400 to 599.9	Azusa	5.89	2.49	1.74	1.21	0.35	0.12	0.04	0.01
400 to 599.9	Banning	13.42	4.36	2.77	1.89	0.58	0.21	0.07	0.02
400 to 599.9	Burbank	6.12	2.40	1.52	0.98	0.23	0.07	0.03	0.01
400 to 599.9	Central LA	9.84	3.70	2.31	1.51	0.37	0.11	0.03	0.01
400 to 599.9	Compton	7.25	2.95	1.96	1.32	0.35	0.11	0.04	0.01
400 to 599.9	Costa Mesa	3.91	1.83	1.32	0.92	0.27	0.10	0.04	0.01
400 to 599.9	Crestline	4.78	1.94	1.25	0.82	0.22	0.08	0.03	0.01
400 to 599.9	Fontana	9.70	3.34	2.22	1.54	0.46	0.17	0.06	0.02
400 to 599.9	Indio	4.33	1.65	1.11	0.77	0.23	0.09	0.03	0.01
400 to 599.9	La Habra	5.13	2.26	1.51	1.01	0.26	0.09	0.03	0.01
400 to 599.9	Lake Elsinore	3.38	1.32	0.94	0.68	0.23	0.09	0.04	0.01
400 to 599.9	LAX	14.98	4.77	3.11	2.14	0.63	0.22	0.08	0.02
400 to 599.9	Long Beach	5.21	2.18	1.40	0.91	0.25	0.08	0.03	0.01
400 to 599.9	Lynwood	6.46	2.67	1.84	1.27	0.36	0.12	0.04	0.01
400 to 599.9	Mission Viejo	4.24	1.65	1.11	0.76	0.21	0.09	0.03	0.01
400 to 599.9	Palm Springs	5.33	1.92	1.20	0.81	0.22	0.08	0.03	0.01
400 to 599.9	Perris	5.50	1.92	1.23	0.85	0.26	0.10	0.04	0.01
400 to 599.9	Pico Rivera	9.29	3.22	2.02	1.31	0.33	0.12	0.04	0.01
400 to 599.9	Pomona	5.87	2.53	1.67	1.10	0.28	0.09	0.03	0.01
400 to 599.9	Redlands	3.42	1.66	1.21	0.86	0.26	0.10	0.04	0.01
400 to 599.9	Reseda	3.19	1.27	0.81	0.54	0.14	0.05	0.02	0.01
400 to 599.9	Riverside	6.40	2.46	1.73	1.22	0.37	0.13	0.05	0.01
400 to 599.9	San Bernardino	5.91	2.22	1.48	1.01	0.29	0.11	0.04	0.01
400 to 599.9	Santa Clarita	11.43	3.67	2.22	1.46	0.38	0.14	0.05	0.01
400 to 599.9	Upland	7.24	2.81	1.96	1.37	0.40	0.14	0.05	0.01
400 to 599.9	West LA	8.40	3.23	2.04	1.31	0.31	0.11	0.04	0.01

Table 4.35
Dispersion Factors (X/Q)
for Diesel ICEs
Operating 12 Hours per Day or Less

Diesel ICE Rating 600 to 1,149 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
600 to 1,149	Anaheim	3.17	1.21	0.95	0.73	0.25	0.11	0.04	0.01
600 to 1,149	Azusa	1.29	0.61	0.53	0.43	0.18	0.09	0.04	0.01
600 to 1,149	Banning	5.76	1.92	1.41	1.08	0.39	0.17	0.06	0.02
600 to 1,149	Burbank	1.23	0.57	0.46	0.35	0.13	0.06	0.02	0.01
600 to 1,149	Central LA	3.56	1.28	0.97	0.72	0.22	0.09	0.03	0.01
600 to 1,149	Compton	2.14	0.85	0.68	0.52	0.18	0.08	0.03	0.01
600 to 1,149	Costa Mesa	0.57	0.35	0.33	0.28	0.14	0.08	0.03	0.01
600 to 1,149	Crestline	1.22	0.54	0.43	0.34	0.13	0.07	0.03	0.01
600 to 1,149	Fontana	3.41	1.22	0.95	0.75	0.28	0.13	0.05	0.01
600 to 1,149	Indio	1.24	0.53	0.43	0.35	0.14	0.07	0.03	0.01
600 to 1,149	La Habra	1.05	0.50	0.43	0.34	0.14	0.07	0.03	0.01
600 to 1,149	Lake Elsinore	0.91	0.41	0.35	0.29	0.13	0.07	0.03	0.01
600 to 1,149	LAX	5.83	1.98	1.50	1.15	0.40	0.17	0.07	0.02
600 to 1,149	Long Beach	0.96	0.52	0.45	0.36	0.13	0.06	0.02	0.01
600 to 1,149	Lynwood	1.58	0.70	0.58	0.47	0.19	0.09	0.04	0.01
600 to 1,149	Mission Viejo	0.69	0.35	0.31	0.26	0.12	0.06	0.03	0.01
600 to 1,149	Palm Springs	2.36	0.83	0.60	0.45	0.15	0.06	0.03	0.01
600 to 1,149	Perris	2.19	0.82	0.60	0.46	0.17	0.08	0.03	0.01
600 to 1,149	Pico Rivera	2.90	1.08	0.80	0.61	0.21	0.09	0.04	0.01
600 to 1,149	Pomona	1.55	0.68	0.55	0.43	0.16	0.08	0.03	0.01
600 to 1,149	Redlands	0.63	0.37	0.35	0.30	0.14	0.08	0.04	0.01
600 to 1,149	Reseda	1.19	0.52	0.38	0.28	0.09	0.04	0.02	0.01
600 to 1,149	Riverside	1.68	0.68	0.58	0.48	0.20	0.10	0.04	0.01
600 to 1,149	San Bernardino	1.93	0.76	0.60	0.47	0.18	0.09	0.04	0.01
600 to 1,149	Santa Clarita	5.31	1.81	1.23	0.89	0.27	0.11	0.04	0.01
600 to 1,149	Upland	1.87	0.76	0.65	0.53	0.22	0.11	0.04	0.01
600 to 1,149	West LA	1.98	0.82	0.65	0.50	0.18	0.09	0.04	0.01

Table 3.31
Dispersion Factors (X/Q)
for Diesel ICEs
Operating More Than 12 Hours per Day

Diesel ICE Rating 50 to 174.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
50 to 174.9	Anaheim	16.34	5.76	3.73	2.64	0.88	0.38	0.17	0.07
50 to 174.9	Azusa	14.25	4.87	3.45	2.60	1.03	0.44	0.19	0.08
50 to 174.9	Banning	30.23	9.60	6.37	4.62	1.77	0.80	0.33	0.12
50 to 174.9	Burbank	15.86	5.66	3.84	2.86	1.07	0.42	0.17	0.07
50 to 174.9	Central LA	15.17	4.87	3.33	2.55	0.98	0.38	0.14	0.06
50 to 174.9	Compton	12.91	4.34	3.05	2.30	0.95	0.41	0.18	0.07
50 to 174.9	Costa Mesa	7.14	2.57	1.76	1.25	0.50	0.27	0.15	0.06
50 to 174.9	Crestline	11.03	3.90	2.50	1.74	0.61	0.29	0.14	0.06
50 to 174.9	Fontana	19.46	6.43	4.36	3.18	1.20	0.54	0.24	0.10
50 to 174.9	Indio	20.40	7.24	4.89	3.60	1.39	0.63	0.28	0.11
50 to 174.9	La Habra	9.02	3.24	2.09	1.43	0.52	0.27	0.14	0.06
50 to 174.9	Lake Elsinore	6.95	2.40	1.62	1.23	0.55	0.31	0.17	0.08
50 to 174.9	LAX	19.93	5.92	3.91	2.80	1.00	0.44	0.19	0.07
50 to 174.9	Long Beach	10.74	3.86	2.84	2.24	1.01	0.43	0.18	0.08
50 to 174.9	Lynwood	11.90	4.02	2.80	2.07	0.82	0.39	0.18	0.08
50 to 174.9	Mission Viejo	9.09	2.87	1.87	1.32	0.50	0.27	0.14	0.06
50 to 174.9	Palm Springs	19.45	6.90	4.51	3.27	1.14	0.47	0.20	0.08
50 to 174.9	Perris	10.07	3.45	2.28	1.64	0.64	0.33	0.17	0.07
50 to 174.9	Pico Rivera	17.36	5.40	3.50	2.47	0.86	0.38	0.17	0.07
50 to 174.9	Pomona	10.95	3.82	2.57	1.86	0.84	0.41	0.20	0.09
50 to 174.9	Redlands	8.13	3.03	2.11	1.52	0.61	0.36	0.25	0.12
50 to 174.9	Reseda	5.46	1.85	1.18	0.82	0.35	0.22	0.13	0.06
50 to 174.9	Riverside	12.27	3.96	2.74	2.00	0.77	0.37	0.18	0.07
50 to 174.9	San Bernardino	14.65	5.16	3.44	2.52	0.97	0.45	0.22	0.09
50 to 174.9	Santa Clarita	15.56	4.54	2.80	1.96	0.69	0.34	0.17	0.07
50 to 174.9	Upland	14.90	4.85	3.35	2.47	0.99	0.46	0.24	0.11
50 to 174.9	West LA	11.21	3.54	2.21	1.46	0.48	0.24	0.14	0.06

Table 3.32
Dispersion Factors (X/Q)
for Diesel ICEs
Operating More Than 12 Hours per Day

Diesel ICE Rating 175 to 299.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
175 to 299.9	Anaheim	13.01	4.47	2.87	2.06	0.68	0.28	0.14	0.06
175 to 299.9	Azusa	10.80	3.57	2.49	1.90	0.76	0.33	0.15	0.07
175 to 299.9	Banning	25.23	7.71	5.01	3.68	1.46	0.68	0.30	0.11
175 to 299.9	Burbank	12.36	4.26	2.79	2.10	0.82	0.32	0.14	0.06
175 to 299.9	Central LA	12.15	3.84	2.48	1.83	0.74	0.29	0.12	0.05
175 to 299.9	Compton	9.77	3.23	2.22	1.67	0.67	0.29	0.14	0.07
175 to 299.9	Costa Mesa	5.24	1.90	1.32	0.94	0.33	0.18	0.11	0.05
175 to 299.9	Crestline	8.54	3.01	1.91	1.36	0.46	0.21	0.11	0.05
175 to 299.9	Fontana	15.68	5.01	3.33	2.47	0.93	0.41	0.20	0.09
175 to 299.9	Indio	16.79	5.75	3.79	2.84	1.11	0.50	0.23	0.10
175 to 299.9	La Habra	6.96	2.50	1.63	1.13	0.37	0.18	0.10	0.05
175 to 299.9	Lake Elsinore	5.29	1.78	1.22	0.89	0.38	0.20	0.12	0.06
175 to 299.9	LAX	16.18	4.72	3.08	2.23	0.79	0.34	0.16	0.07
175 to 299.9	Long Beach	7.86	2.74	1.95	1.53	0.70	0.31	0.15	0.07
175 to 299.9	Lynwood	9.15	3.03	2.09	1.56	0.60	0.27	0.14	0.07
175 to 299.9	Mission Viejo	6.47	1.98	1.26	0.90	0.34	0.17	0.10	0.05
175 to 299.9	Palm Springs	16.25	5.52	3.54	2.60	0.92	0.36	0.17	0.08
175 to 299.9	Perris	8.17	2.72	1.77	1.29	0.48	0.24	0.13	0.06
175 to 299.9	Pico Rivera	13.67	4.18	2.64	1.91	0.65	0.28	0.14	0.06
175 to 299.9	Pomona	8.32	2.92	1.92	1.37	0.51	0.26	0.15	0.08
175 to 299.9	Redlands	5.91	2.17	1.51	1.11	0.42	0.21	0.18	0.10
175 to 299.9	Reseda	4.37	1.45	0.91	0.63	0.21	0.13	0.10	0.05
175 to 299.9	Riverside	9.43	2.97	2.04	1.51	0.57	0.26	0.14	0.06
175 to 299.9	San Bernardino	11.72	3.97	2.59	1.93	0.73	0.33	0.17	0.08
175 to 299.9	Santa Clarita	12.97	3.70	2.22	1.56	0.53	0.24	0.13	0.06
175 to 299.9	Upland	11.46	3.63	2.48	1.85	0.70	0.33	0.17	0.09
175 to 299.9	West LA	8.55	2.75	1.72	1.17	0.35	0.16	0.10	0.05

Table 3.33
Dispersion Factors (X/Q)
for Diesel ICEs
Operating More Than 12 Hours per Day

Diesel ICE Rating 300 to 399.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
300 to 399.9	Anaheim	8.09	2.98	1.79	1.27	0.38	0.15	0.08	0.05
300 to 399.9	Azusa	6.60	2.36	1.51	1.15	0.42	0.17	0.09	0.05
300 to 399.9	Banning	18.55	5.84	3.46	2.56	1.06	0.50	0.24	0.10
300 to 399.9	Burbank	7.87	2.86	1.68	1.23	0.46	0.18	0.09	0.05
300 to 399.9	Central LA	8.60	2.85	1.74	1.25	0.41	0.16	0.08	0.04
300 to 399.9	Compton	6.20	2.23	1.42	1.06	0.38	0.15	0.08	0.05
300 to 399.9	Costa Mesa	3.09	1.29	0.86	0.64	0.20	0.10	0.06	0.04
300 to 399.9	Crestline	5.64	2.08	1.22	0.86	0.29	0.12	0.07	0.04
300 to 399.9	Fontana	10.53	3.52	2.14	1.58	0.57	0.24	0.13	0.07
300 to 399.9	Indio	11.59	4.08	2.43	1.80	0.71	0.31	0.16	0.08
300 to 399.9	La Habra	4.21	1.67	1.04	0.73	0.22	0.10	0.06	0.04
300 to 399.9	Lake Elsinore	3.18	1.13	0.73	0.55	0.19	0.08	0.06	0.04
300 to 399.9	LAX	11.30	3.47	2.11	1.54	0.52	0.21	0.11	0.05
300 to 399.9	Long Beach	4.71	1.80	1.17	0.90	0.37	0.15	0.09	0.06
300 to 399.9	Lynwood	5.71	2.06	1.33	0.99	0.34	0.14	0.08	0.05
300 to 399.9	Mission Viejo	3.67	1.26	0.76	0.54	0.15	0.07	0.06	0.04
300 to 399.9	Palm Springs	11.37	3.96	2.36	1.73	0.62	0.23	0.11	0.06
300 to 399.9	Perris	5.46	1.88	1.12	0.82	0.28	0.13	0.08	0.05
300 to 399.9	Pico Rivera	9.15	2.93	1.69	1.20	0.39	0.16	0.09	0.05
300 to 399.9	Pomona	5.23	1.99	1.23	0.87	0.26	0.12	0.09	0.06
300 to 399.9	Redlands	3.40	1.42	0.95	0.71	0.24	0.11	0.09	0.07
300 to 399.9	Reseda	2.99	1.05	0.63	0.45	0.13	0.06	0.05	0.04
300 to 399.9	Riverside	5.83	2.00	1.29	0.97	0.33	0.14	0.08	0.05
300 to 399.9	San Bernardino	7.65	2.67	1.59	1.16	0.41	0.18	0.11	0.06
300 to 399.9	Santa Clarita	9.06	2.76	1.57	1.09	0.34	0.15	0.08	0.04
300 to 399.9	Upland	7.44	2.52	1.59	1.19	0.42	0.18	0.10	0.07
300 to 399.9	West LA	5.55	1.96	1.18	0.80	0.21	0.09	0.05	0.04

Table 3.34
Dispersion Factors (X/Q)
for Diesel ICEs
Operating More Than 12 Hours per Day

Diesel ICE Rating 400 to 599.9 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
400 to 599.9	Anaheim	5.70	2.18	1.36	0.91	0.29	0.10	0.05	0.03
400 to 599.9	Azusa	4.20	1.55	1.05	0.74	0.28	0.11	0.06	0.04
400 to 599.9	Banning	13.98	4.43	2.67	1.79	0.78	0.38	0.19	0.08
400 to 599.9	Burbank	5.48	2.03	1.21	0.80	0.31	0.12	0.06	0.04
400 to 599.9	Central LA	6.15	2.13	1.36	0.92	0.31	0.11	0.05	0.03
400 to 599.9	Compton	3.99	1.53	1.02	0.71	0.25	0.10	0.05	0.04
400 to 599.9	Costa Mesa	1.78	0.79	0.56	0.40	0.14	0.06	0.04	0.03
400 to 599.9	Crestline	3.86	1.45	0.87	0.58	0.21	0.09	0.05	0.03
400 to 599.9	Fontana	7.64	2.58	1.61	1.10	0.42	0.17	0.08	0.05
400 to 599.9	Indio	8.80	3.09	1.84	1.23	0.51	0.23	0.11	0.06
400 to 599.9	La Habra	2.65	1.08	0.71	0.47	0.15	0.06	0.04	0.03
400 to 599.9	Lake Elsinore	2.10	0.75	0.51	0.36	0.14	0.06	0.03	0.03
400 to 599.9	LAX	8.33	2.64	1.67	1.14	0.40	0.16	0.07	0.04
400 to 599.9	Long Beach	2.89	1.19	0.82	0.58	0.23	0.09	0.05	0.04
400 to 599.9	Lynwood	3.74	1.43	0.97	0.68	0.24	0.09	0.05	0.04
400 to 599.9	Mission Viejo	2.14	0.75	0.49	0.33	0.11	0.05	0.03	0.02
400 to 599.9	Palm Springs	8.82	3.11	1.87	1.27	0.48	0.19	0.08	0.05
400 to 599.9	Perris	4.07	1.44	0.88	0.59	0.21	0.09	0.05	0.03
400 to 599.9	Pico Rivera	6.42	2.16	1.28	0.84	0.28	0.11	0.05	0.03
400 to 599.9	Pomona	3.48	1.38	0.89	0.60	0.19	0.07	0.05	0.04
400 to 599.9	Redlands	1.91	0.83	0.60	0.43	0.15	0.07	0.05	0.05
400 to 599.9	Reseda	2.19	0.78	0.48	0.32	0.10	0.04	0.03	0.02
400 to 599.9	Riverside	3.87	1.37	0.93	0.66	0.24	0.10	0.05	0.03
400 to 599.9	San Bernardino	5.56	1.96	1.20	0.80	0.30	0.12	0.07	0.04
400 to 599.9	Santa Clarita	6.95	2.19	1.27	0.83	0.26	0.11	0.06	0.03
400 to 599.9	Upland	4.87	1.71	1.14	0.80	0.29	0.12	0.06	0.04
400 to 599.9	West LA	3.68	1.39	0.87	0.56	0.16	0.06	0.03	0.03

Table 3.35
Dispersion Factors (X/Q)
for Diesel ICEs
Operating More Than 12 Hours per Day

Diesel ICE Rating 600 to 1,149 BHP

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Rating (BHP)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
600 to 1,149	Anaheim	1.40	0.53	0.41	0.31	0.11	0.05	0.03	0.02
600 to 1,149	Azusa	0.76	0.29	0.24	0.20	0.09	0.05	0.02	0.02
600 to 1,149	Banning	5.22	1.62	1.06	0.77	0.32	0.19	0.10	0.05
600 to 1,149	Burbank	0.77	0.30	0.23	0.17	0.07	0.04	0.02	0.02
600 to 1,149	Central LA	1.90	0.64	0.49	0.37	0.13	0.06	0.03	0.01
600 to 1,149	Compton	0.98	0.37	0.30	0.24	0.09	0.05	0.03	0.02
600 to 1,149	Costa Mesa	0.27	0.15	0.14	0.12	0.06	0.04	0.02	0.01
600 to 1,149	Crestline	0.90	0.34	0.24	0.18	0.08	0.04	0.02	0.01
600 to 1,149	Fontana	2.20	0.75	0.54	0.41	0.16	0.08	0.04	0.02
600 to 1,149	Indio	2.88	1.00	0.63	0.45	0.17	0.10	0.06	0.03
600 to 1,149	La Habra	0.47	0.22	0.18	0.14	0.06	0.04	0.02	0.01
600 to 1,149	Lake Elsinore	0.46	0.19	0.16	0.13	0.06	0.03	0.02	0.01
600 to 1,149	LAX	2.73	0.90	0.67	0.51	0.18	0.08	0.04	0.02
600 to 1,149	Long Beach	0.55	0.26	0.23	0.18	0.08	0.04	0.02	0.02
600 to 1,149	Lynwood	0.73	0.31	0.26	0.21	0.09	0.05	0.02	0.02
600 to 1,149	Mission Viejo	0.28	0.14	0.12	0.10	0.05	0.03	0.02	0.01
600 to 1,149	Palm Springs	3.28	1.02	0.69	0.51	0.20	0.10	0.05	0.03
600 to 1,149	Perris	1.29	0.46	0.32	0.24	0.09	0.05	0.02	0.02
600 to 1,149	Pico Rivera	1.55	0.55	0.39	0.29	0.10	0.05	0.02	0.01
600 to 1,149	Pomona	0.76	0.31	0.25	0.19	0.07	0.04	0.02	0.02
600 to 1,149	Redlands	0.28	0.16	0.15	0.13	0.07	0.04	0.02	0.02
600 to 1,149	Reseda	0.72	0.27	0.19	0.14	0.05	0.03	0.02	0.01
600 to 1,149	Riverside	0.86	0.33	0.27	0.22	0.10	0.05	0.03	0.02
600 to 1,149	San Bernardino	1.50	0.53	0.38	0.29	0.11	0.06	0.03	0.02
600 to 1,149	Santa Clarita	2.69	0.89	0.59	0.42	0.14	0.07	0.03	0.02
600 to 1,149	Upland	1.03	0.39	0.32	0.26	0.11	0.06	0.03	0.02
600 to 1,149	West LA	0.76	0.32	0.25	0.20	0.07	0.04	0.02	0.01

Table 6.31

Dispersion Factors (χ/Q)
for Diesel ICEs
for Acute Hazard Index

All Operating Conditions χ/Q Values ([μg/m^3]/[lb/hr])

Rating (BHP)	Downwind Distance (meters)							
	25	50	75	100	200	300	500	1,000
50 to 174.9	318.31	132.73	103.23	88.20	41.49	16.33	6.95	4.09
175 to 299.9	249.82	100.51	66.01	55.34	27.05	9.36	4.17	2.96
300 to 399.9	208.60	72.20	48.27	35.75	18.22	7.63	3.58	2.01
400 to 599.9	370.47	168.04	134.78	113.29	53.36	22.07	8.91	4.63
600 to 1,149	110.56	35.42	25.31	19.18	7.78	4.82	2.54	1.13

APPENDIX VIII

TIER 2 SCREENING TABLES FOR CREMATORIUMS FOR USE IN RULE 1401

Introduction

The purpose of this report is to document the methods used by SCAQMD staff to estimate cancer risks from the industry-wide source category of crematoriums. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD for crematoriums ONLY.

Emission Inventory Methods

For emission rates associated with crematoriums, please contact the appropriate SCAQMD Engineering staff (http://www.aqmd.gov/contact/permitting-staff).

Exposure Modeling Methods

Air quality modeling was performed using AERMOD (American Meteorological Society/U.S. EPA Regulatory Model). As of December 9, 2006, U.S. EPA promulgated AERMOD as a replacement for ISCST3 (Industrial Source Complex – Short Term, Version 3) as the recommended dispersion model. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

AERMOD (version 14134) was executed using the urban option, which is SCAQMD policy for all permitting in its jurisdiction. The U.S. EPA regulatory default options, with the exception of the FLAT terrain option, were implemented and the SCAQMD AERMOD-ready meteorological data was used. The County populations used are based on the 2008 estimates from the U.S. Census Bureau. The Los Angeles County population was 9,862,049; Orange County population was 3,010,759; Riverside County population was 2,100,516; and San Bernardino County population was 2,015,355. SCAQMD's meteorological data is updated on a tri-annual basis and the population estimates will also be updated at that time.

For screening purposes, flat terrain was assumed. Although this is appropriate for most projects within the South Coast Air Basin, it is important to note that if complex terrain is present, the screening tables are not appropriate to be used and project-specific modeling using the elevated terrain option is recommended.

Based on information from SCAQMD Engineering staff, the stack was modeled as a point source with the following stack parameters – 19-ft stack height, 5.8 m/s exit velocity, 1300ºF exit temperature, and 13-ft building height. Due to the sensitivity to building downwash effects, there are three different building sizes analyzed.

Modeling was performed at 27 SCAQMD meteorological stations shown in Figure 1. The locations of each of the sites are given in Table 1. The data are available on the SCAQMD website (http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod). A polar receptor grid is assumed at ten degree azimuth increments at the following downwind distances: 25, 50, 75, 100, 200, 300, 500, and 1000 meters.

The peak model-predicted impacts at each downwind distance over the 36 azimuth angles for each meteorological station were used to develop the attached tables.

A sample AERMOD model input file is provided in Exhibit 1.

Figure 1: Meteorological Monitoring Stations in the South Coast Air Basin

Table 1: Locations of Meteorological Stations and Elevations

Station name	UTM Coordinates (km)		Lat./Long. Coordinates		Elevation
	Easting	Northing	Latitude	Longitude	(m)
Anaheim	413.14	3743.57	33:49:50	117:56:19	41
Azusa	414.81	3777.47	34:08:11	117:55:26	182
Banning	513.10	3753.19	33:55:15	116:51:30	660
Burbank	378.62	3782.24	34:10:33	118:19:01	175
Central LA	386.79	3770.00	34:03:59	118:13:36	87
Compton	388.59	3751.88	33:54:05	118:12:18	22
Costa Mesa	414.16	3726.19	33:40:26	117:55:33	20
Crestline	474.62	3788.76	34:14:29	117:16:32	1387
Fontana	454.62	3773.19	34:06:01	117:29:31	367
Indio	572.67	3729.90	33:42:30	116:12:57	-4
La Habra	411.98	3754.08	33:55:31	117:57:08	82
Lake Elsinore	469.33	3726.13	33:40:35	117:19:51	406
LAX	367.83	3757.80	33:57:15	118:25:49	42
Long Beach	389.99	3743.04	33:49:25	118:11:19	30
Lynwood	388.07	3754.73	33:55:44	118:12:39	29
Mission Viejo	437.39	3721.17	33:37:49	117:40:30	170
Palm Springs	542.46	3745.73	33:51:10	116:32:28	171
Perris	478.91	3738.58	33:47:20	117:13:40	442
Pico Rivera	401.31	3763.61	34:00:37	118:04:07	58
Pomona	430.78	3769.61	34:04:00	117:45:00	270
Redlands	486.36	3768.50	34:03:32	117:08:52	481
Reseda	358.76	3785.11	34:11:57	118:31:58	228
Riverside	461.64	3762.10	34:00:02	117:24:55	250
San Bernardino	474.76	3773.82	34:06:24	117:16:25	305
Santa Clarita	359.48	3805.52	34:23:00	118:31:42	375
Upland	441.96	3773.66	34:06:14	117:37:45	379
West LA	365.54	3768.52	34:03:02	118:27:24	97

Exhibit 1: Sample AERMOD Model Input File for Crematoriums

```
CO STARTING
   TITLEONE Modeling for R1401 Risk Assessment Procedures - Crematoriums
   TITLETWO Continuous Operation
   MODELOPT CONC FLAT
   AVERTIME 1   PERIOD
   POLLUTID Any
   RUNORNOT RUN
   URBANOPT 3010759 ORC
CO FINISHED

SO STARTING
   LOCATION P1 POINT     0.0    0.0    0.0
   LOCATION P2 POINT     0.0    0.0    0.0
   LOCATION P3 POINT     0.0    0.0    0.0

** Point Source      Q      RelHgt   Temp     Vel       Dia
**              ---------   ------  ------  ------    ------
   SRCPARAM P1     0.0865    5.791  977.59    5.8      0.508
   SRCPARAM P2     0.0865    5.791  977.59    5.8      0.508
   SRCPARAM P3     0.0865    5.791  977.59    5.8      0.508

SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDWID P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDWID P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDWID P1   30.36    30.36    29.44    27.62    24.97    21.55
SO BUILDWID P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDWID P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDWID P1   30.36    30.36    29.44    27.62    24.97    21.55
SO BUILDLEN P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDLEN P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDLEN P1   30.36    30.36    29.44    27.62    24.97    21.55
SO BUILDLEN P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDLEN P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDLEN P1   30.36    30.36    29.44    27.62    24.97    21.55
SO XBADJ    P1  -12.48   -13.81   -14.72   -15.18   -15.18   -14.72
SO XBADJ    P1  -13.81   -12.48   -10.78   -12.48   -13.81   -14.72
SO XBADJ    P1  -15.18   -15.18   -14.72   -13.81   -12.48   -10.78
SO XBADJ    P1  -12.48   -13.81   -14.72   -15.18   -15.18   -14.72
SO XBADJ    P1  -13.81   -12.48   -10.78   -12.48   -13.81   -14.72
SO XBADJ    P1  -15.18   -15.18   -14.72   -13.81   -12.48   -10.78
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDWID P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDWID P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDWID P2   42.94    42.94    41.64    39.07    35.31    30.48
SO BUILDWID P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDWID P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDWID P2   42.94    42.94    41.64    39.07    35.31    30.48
SO BUILDLEN P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDLEN P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDLEN P2   42.94    42.94    41.64    39.07    35.31    30.48
SO BUILDLEN P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDLEN P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDLEN P2   42.94    42.94    41.64    39.07    35.31    30.48
SO XBADJ    P2  -17.65   -19.53   -20.82   -21.47   -21.47   -20.82
SO XBADJ    P2  -19.53   -17.65   -15.24   -17.65   -19.53   -20.82
SO XBADJ    P2  -21.47   -21.47   -20.82   -19.53   -17.65   -15.24
SO XBADJ    P2  -17.65   -19.53   -20.82   -21.47   -21.47   -20.82
SO XBADJ    P2  -19.53   -17.65   -15.24   -17.65   -19.53   -20.82
SO XBADJ    P2  -21.47   -21.47   -20.82   -19.53   -17.65   -15.24
```

```
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00

SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDWID P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDWID P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDWID P3   52.59    52.59    50.99    47.85    43.25    37.33
SO BUILDWID P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDWID P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDWID P3   52.59    52.59    50.99    47.85    43.25    37.33
SO BUILDLEN P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDLEN P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDLEN P3   52.59    52.59    50.99    47.85    43.25    37.33
SO BUILDLEN P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDLEN P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDLEN P3   52.59    52.59    50.99    47.85    43.25    37.33
SO XBADJ    P3  -21.62   -23.92   -25.50   -26.30   -26.30   -25.50
SO XBADJ    P3  -23.92   -21.62   -18.67   -21.62   -23.92   -25.50
SO XBADJ    P3  -26.30   -26.30   -25.50   -23.92   -21.62   -18.67
SO XBADJ    P3  -21.62   -23.92   -25.50   -26.30   -26.30   -25.50
SO XBADJ    P3  -23.92   -21.62   -18.67   -21.62   -23.92   -25.50
SO XBADJ    P3  -26.30   -26.30   -25.50   -23.92   -21.62   -18.67
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00

   URBANSRC P1
   URBANSRC P2
   URBANSRC P3

   SRCGROUP  P1  P1
   SRCGROUP  P2  P2
   SRCGROUP  P3  P3

SO SRCGROUP  ALL

SO FINISHED

RE STARTING
   GRIDPOLR POL1 STA
                 ORIG     0.0     0.0
                 DIST  25 50 75 100 200 300 500 1000
                 GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED

ME STARTING
   SURFFILE ANAH8.SFC
   PROFFILE ANAH8.PFL
   SURFDATA 0    2006
   UAIRDATA 3190 2006
   PROFBASE 0    METERS
ME FINISHED

OU STARTING
   RECTABLE  1       FIRST
   RECTABLE  ALLAVE  FIRST
   PLOTFILE  1       P1  FIRST  BM1T1P1.TXT
   PLOTFILE  PERIOD  P1         BM1T2P1.TXT
   PLOTFILE  1       P2  FIRST  BM1T1P2.TXT
   PLOTFILE  PERIOD  P2         BM1T2P2.TXT
   PLOTFILE  1       P3  FIRST  BM1T1P3.TXT
   PLOTFILE  PERIOD  P3         BM1T2P3.TXT
OU FINISHED
```

Results

Figure 2 shows the source receptor areas (SRA) within the South Coast Air Basin and Table 2 lists the appropriate meteorological station to use for each SRA.

Figure 2: Source/Receptor Areas

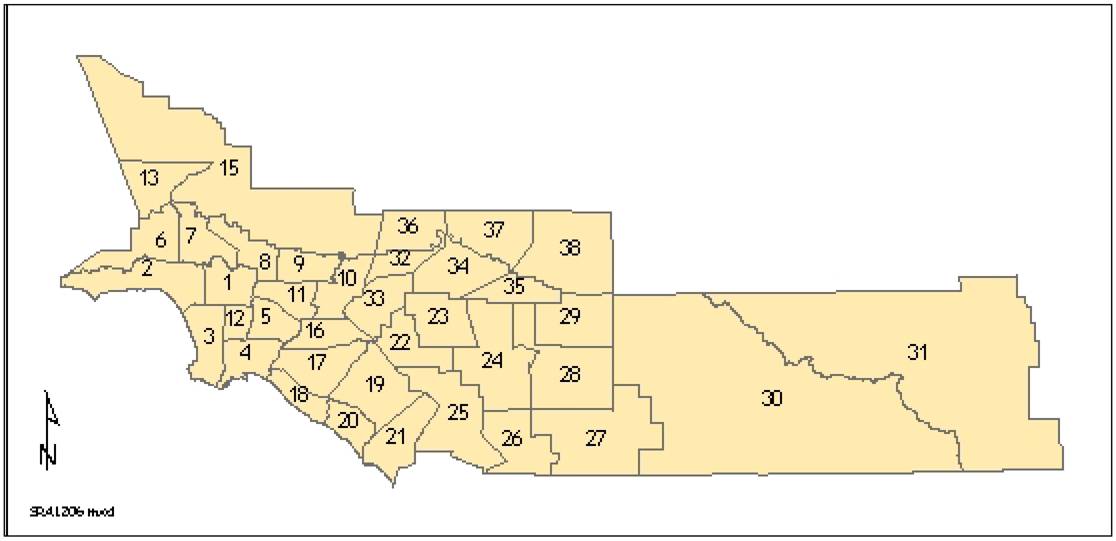


Table 2: Meteorological Stations for Each Source/Receptor Area.

Meteorological Station	Source/ Receptor Area	Meteorological Station	Source/ Receptor Area
Anaheim	17	Compton/Lynwood	12
Azusa	8, 9	Mission Viejo	19, 21
Banning	29	Perris	24, 28
Burbank	7	Palm Springs	30, 31
Central LA	1	Pico Rivera	5, 11
Crestline	37	Pomona	10
Costa Mesa	18, 20	Redlands	35, 38
Fontana	34	Reseda	6
Indio	30	Riverside	22, 23
La Habra	16	Santa Clarita	13, 15
Lake Elsinore	25, 26, 27	San Bernardino	34
LAX	3	Upland	32, 33, 36
Long Beach	4	West LA	2

The following tables have been numbered to be consistent with the tables within Permit Application Attachment "M" for the Risk Assessment Procedures for Rules 1401 & 212.

Table 4.41
Dispersion Factors (χ/Q)
for Crematoriums
Operating 12 Hours per Day or Less

Building Area ≥ 5,000 to 10,000 ft^2, Stack Height ≤ 19 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
≥ 5,000 to 10,000	19	Anaheim	10.50	3.45	2.22	1.49	0.40	0.16	0.06	0.01
≥ 5,000 to 10,000	19	Azusa	6.74	2.71	1.79	1.23	0.34	0.13	0.05	0.01
≥ 5,000 to 10,000	19	Banning	17.63	4.78	2.77	1.84	0.51	0.21	0.08	0.02
≥ 5,000 to 10,000	19	Burbank	5.85	2.29	1.44	0.93	0.23	0.09	0.03	0.01
≥ 5,000 to 10,000	19	Central LA	11.56	3.19	1.92	1.23	0.31	0.12	0.04	0.01
≥ 5,000 to 10,000	19	Compton	8.55	2.77	1.73	1.14	0.29	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Costa Mesa	4.30	2.18	1.49	1.01	0.28	0.12	0.04	0.01
≥ 5,000 to 10,000	19	Crestline	4.86	2.08	1.37	0.91	0.25	0.10	0.04	0.01
≥ 5,000 to 10,000	19	Fontana	11.50	3.49	2.25	1.54	0.44	0.18	0.06	0.02
≥ 5,000 to 10,000	19	Indio	4.64	1.79	1.21	0.85	0.24	0.10	0.04	0.01
≥ 5,000 to 10,000	19	La Habra	5.59	2.42	1.58	1.05	0.28	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Lake Elsinore	3.70	1.60	1.13	0.81	0.25	0.10	0.04	0.01
≥ 5,000 to 10,000	19	LAX	17.61	4.71	2.96	2.02	0.57	0.22	0.08	0.02
≥ 5,000 to 10,000	19	Long Beach	4.63	2.00	1.30	0.85	0.21	0.09	0.03	0.01
≥ 5,000 to 10,000	19	Lynwood	7.19	2.68	1.75	1.19	0.32	0.13	0.05	0.01
≥ 5,000 to 10,000	19	Mission Viejo	3.54	1.79	1.24	0.85	0.24	0.10	0.04	0.01
≥ 5,000 to 10,000	19	Palm Springs	6.80	1.93	1.20	0.80	0.21	0.09	0.03	0.01
≥ 5,000 to 10,000	19	Perris	6.54	2.00	1.28	0.89	0.26	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Pico Rivera	9.12	3.02	1.91	1.28	0.34	0.13	0.05	0.01
≥ 5,000 to 10,000	19	Pomona	6.51	2.52	1.61	1.06	0.28	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Redlands	4.14	2.14	1.46	1.00	0.28	0.12	0.05	0.01
≥ 5,000 to 10,000	19	Reseda	3.16	1.38	0.87	0.58	0.16	0.06	0.02	0.01
≥ 5,000 to 10,000	19	Riverside	7.30	2.67	1.79	1.24	0.35	0.14	0.05	0.01
≥ 5,000 to 10,000	19	San Bernardino	6.78	2.38	1.55	1.06	0.30	0.12	0.05	0.01
≥ 5,000 to 10,000	19	Santa Clarita	13.56	3.61	2.10	1.37	0.36	0.14	0.05	0.01
≥ 5,000 to 10,000	19	Upland	8.17	2.97	1.98	1.37	0.38	0.15	0.06	0.02
≥ 5,000 to 10,000	19	West LA	7.54	2.94	1.89	1.25	0.32	0.13	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.42
Dispersion Factors (χ/Q)
for Crematoriums
Operating 12 Hours per Day or Less

Building Area > 10,000 to 15,000 ft^2, Stack Height ≤ 19 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 10,000 to 15,000	19	Anaheim	13.48	3.86	2.42	1.61	0.42	0.16	0.06	0.01
> 10,000 to 15,000	19	Azusa	9.33	3.05	1.98	1.35	0.36	0.14	0.05	0.01
> 10,000 to 15,000	19	Banning	20.22	5.06	2.93	1.92	0.54	0.21	0.08	0.02
> 10,000 to 15,000	19	Burbank	8.10	2.49	1.57	1.02	0.25	0.09	0.03	0.01
> 10,000 to 15,000	19	Central LA	13.51	3.43	2.06	1.33	0.33	0.12	0.04	0.01
> 10,000 to 15,000	19	Compton	11.03	2.97	1.85	1.23	0.32	0.12	0.04	0.01
> 10,000 to 15,000	19	Costa Mesa	6.95	2.47	1.65	1.12	0.30	0.12	0.04	0.01
> 10,000 to 15,000	19	Crestline	7.03	2.28	1.49	0.99	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	Fontana	13.42	3.88	2.43	1.66	0.46	0.18	0.06	0.02
> 10,000 to 15,000	19	Indio	6.01	2.01	1.32	0.91	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	La Habra	7.96	2.69	1.73	1.15	0.30	0.12	0.04	0.01
> 10,000 to 15,000	19	Lake Elsinore	5.02	1.81	1.23	0.87	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	LAX	19.42	5.18	3.18	2.15	0.60	0.23	0.08	0.02
> 10,000 to 15,000	19	Long Beach	7.57	2.19	1.42	0.94	0.24	0.09	0.03	0.01
> 10,000 to 15,000	19	Lynwood	9.58	2.95	1.90	1.29	0.35	0.13	0.05	0.01
> 10,000 to 15,000	19	Mission Viejo	5.84	2.04	1.38	0.95	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	Palm Springs	7.10	2.01	1.25	0.83	0.22	0.09	0.03	0.01
> 10,000 to 15,000	19	Perris	7.43	2.19	1.37	0.94	0.27	0.11	0.04	0.01
> 10,000 to 15,000	19	Pico Rivera	12.06	3.38	2.09	1.40	0.37	0.14	0.05	0.01
> 10,000 to 15,000	19	Pomona	8.87	2.80	1.76	1.16	0.30	0.11	0.04	0.01
> 10,000 to 15,000	19	Redlands	6.41	2.40	1.61	1.11	0.30	0.12	0.05	0.01
> 10,000 to 15,000	19	Reseda	4.64	1.43	0.91	0.61	0.17	0.07	0.02	0.01
> 10,000 to 15,000	19	Riverside	9.55	2.96	1.94	1.34	0.37	0.14	0.05	0.01
> 10,000 to 15,000	19	San Bernardino	8.39	2.63	1.68	1.13	0.31	0.12	0.05	0.01
> 10,000 to 15,000	19	Santa Clarita	15.32	3.73	2.20	1.44	0.39	0.15	0.05	0.01
> 10,000 to 15,000	19	Upland	10.99	3.34	2.17	1.49	0.41	0.16	0.06	0.02
> 10,000 to 15,000	19	West LA	10.77	3.30	2.08	1.38	0.35	0.13	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.43
Dispersion Factors (χ/Q)
for Crematoriums
Operating 12 Hours per Day or Less

Building Area > 15,000 ft^2, Stack Height ≤ 19 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 15,000	19	Anaheim	14.87	4.07	2.53	1.68	0.43	0.16	0.06	0.01
> 15,000	19	Azusa	10.86	3.31	2.08	1.41	0.37	0.14	0.05	0.01
> 15,000	19	Banning	19.64	5.16	2.99	1.97	0.55	0.21	0.08	0.02
> 15,000	19	Burbank	9.91	2.67	1.65	1.07	0.26	0.09	0.03	0.01
> 15,000	19	Central LA	14.61	3.59	2.13	1.38	0.33	0.12	0.04	0.01
> 15,000	19	Compton	12.16	3.15	1.92	1.27	0.33	0.12	0.04	0.01
> 15,000	19	Costa Mesa	8.67	2.75	1.74	1.19	0.31	0.12	0.04	0.01
> 15,000	19	Crestline	8.49	2.43	1.55	1.03	0.27	0.10	0.04	0.01
> 15,000	19	Fontana	14.08	4.06	2.52	1.71	0.47	0.18	0.06	0.02
> 15,000	19	Indio	6.74	2.12	1.38	0.94	0.26	0.10	0.04	0.01
> 15,000	19	La Habra	9.51	2.88	1.82	1.21	0.30	0.12	0.04	0.01
> 15,000	19	Lake Elsinore	5.83	1.93	1.29	0.90	0.26	0.10	0.04	0.01
> 15,000	19	LAX	19.46	5.36	3.26	2.20	0.61	0.23	0.08	0.02
> 15,000	19	Long Beach	8.79	2.42	1.49	0.99	0.25	0.09	0.03	0.01
> 15,000	19	Lynwood	10.86	3.16	1.98	1.34	0.36	0.13	0.05	0.01
> 15,000	19	Mission Viejo	7.38	2.28	1.45	1.00	0.27	0.10	0.04	0.01
> 15,000	19	Palm Springs	7.28	2.04	1.26	0.84	0.22	0.09	0.03	0.01
> 15,000	19	Perris	7.77	2.27	1.41	0.96	0.27	0.11	0.04	0.01
> 15,000	19	Pico Rivera	13.57	3.65	2.19	1.46	0.38	0.14	0.05	0.01
> 15,000	19	Pomona	10.19	3.04	1.85	1.22	0.30	0.12	0.04	0.01
> 15,000	19	Redlands	7.82	2.66	1.70	1.16	0.31	0.12	0.05	0.01
> 15,000	19	Reseda	4.99	1.48	0.93	0.62	0.17	0.07	0.02	0.01
> 15,000	19	Riverside	10.70	3.17	2.02	1.39	0.38	0.15	0.05	0.01
> 15,000	19	San Bernardino	9.23	2.77	1.75	1.17	0.32	0.12	0.05	0.01
> 15,000	19	Santa Clarita	14.93	3.77	2.22	1.46	0.39	0.15	0.05	0.01
> 15,000	19	Upland	12.30	3.63	2.28	1.56	0.42	0.16	0.06	0.02
> 15,000	19	West LA	12.48	3.60	2.19	1.45	0.36	0.14	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 5.41
Dispersion Factors (χ/Q)
for Crematoriums
Operating More Than 12 Hours per Day

Building Area ≥ 5,000 to 10,000 ft^2, Stack Height ≤ 19 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
≥ 5,000 to 10,000	19	Anaheim	10.50	3.45	2.22	1.49	0.40	0.16	0.06	0.01
≥ 5,000 to 10,000	19	Azusa	6.74	2.71	1.79	1.23	0.34	0.13	0.05	0.01
≥ 5,000 to 10,000	19	Banning	17.63	4.78	2.77	1.84	0.51	0.21	0.08	0.02
≥ 5,000 to 10,000	19	Burbank	5.85	2.29	1.44	0.93	0.23	0.09	0.03	0.01
≥ 5,000 to 10,000	19	Central LA	11.56	3.19	1.92	1.23	0.31	0.12	0.04	0.01
≥ 5,000 to 10,000	19	Compton	8.55	2.77	1.73	1.14	0.29	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Costa Mesa	4.30	2.18	1.49	1.01	0.28	0.12	0.04	0.01
≥ 5,000 to 10,000	19	Crestline	4.86	2.08	1.37	0.91	0.25	0.10	0.04	0.01
≥ 5,000 to 10,000	19	Fontana	11.50	3.49	2.25	1.54	0.44	0.18	0.06	0.02
≥ 5,000 to 10,000	19	Indio	4.64	1.79	1.21	0.85	0.24	0.10	0.04	0.01
≥ 5,000 to 10,000	19	La Habra	5.59	2.42	1.58	1.05	0.28	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Lake Elsinore	3.70	1.60	1.13	0.81	0.25	0.10	0.04	0.01
≥ 5,000 to 10,000	19	LAX	17.61	4.71	2.96	2.02	0.57	0.22	0.08	0.02
≥ 5,000 to 10,000	19	Long Beach	4.63	2.00	1.30	0.85	0.21	0.09	0.03	0.01
≥ 5,000 to 10,000	19	Lynwood	7.19	2.68	1.75	1.19	0.32	0.13	0.05	0.01
≥ 5,000 to 10,000	19	Mission Viejo	3.54	1.79	1.24	0.85	0.24	0.10	0.04	0.01
≥ 5,000 to 10,000	19	Palm Springs	6.80	1.93	1.20	0.80	0.21	0.09	0.03	0.01
≥ 5,000 to 10,000	19	Perris	6.54	2.00	1.28	0.89	0.26	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Pico Rivera	9.12	3.02	1.91	1.28	0.34	0.13	0.05	0.01
≥ 5,000 to 10,000	19	Pomona	6.51	2.52	1.61	1.06	0.28	0.11	0.04	0.01
≥ 5,000 to 10,000	19	Redlands	4.14	2.14	1.46	1.00	0.28	0.12	0.05	0.01
≥ 5,000 to 10,000	19	Reseda	3.16	1.38	0.87	0.58	0.16	0.06	0.02	0.01
≥ 5,000 to 10,000	19	Riverside	7.30	2.67	1.79	1.24	0.35	0.14	0.05	0.01
≥ 5,000 to 10,000	19	San Bernardino	6.78	2.38	1.55	1.06	0.30	0.12	0.05	0.01
≥ 5,000 to 10,000	19	Santa Clarita	13.56	3.61	2.10	1.37	0.36	0.14	0.05	0.01
≥ 5,000 to 10,000	19	Upland	8.17	2.97	1.98	1.37	0.38	0.15	0.06	0.02
≥ 5,000 to 10,000	19	West LA	7.54	2.94	1.89	1.25	0.32	0.13	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.42
Dispersion Factors (χ/Q)
for Crematoriums
Operating More Than 12 Hours per Day

Building Area > 10,000 to 15,000 ft^2, Stack Height ≤ 19 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 10,000 to 15,000	19	Anaheim	13.48	3.86	2.42	1.61	0.42	0.16	0.06	0.01
> 10,000 to 15,000	19	Azusa	9.33	3.05	1.98	1.35	0.36	0.14	0.05	0.01
> 10,000 to 15,000	19	Banning	20.22	5.06	2.93	1.92	0.54	0.21	0.08	0.02
> 10,000 to 15,000	19	Burbank	8.10	2.49	1.57	1.02	0.25	0.09	0.03	0.01
> 10,000 to 15,000	19	Central LA	13.51	3.43	2.06	1.33	0.33	0.12	0.04	0.01
> 10,000 to 15,000	19	Compton	11.03	2.97	1.85	1.23	0.32	0.12	0.04	0.01
> 10,000 to 15,000	19	Costa Mesa	6.95	2.47	1.65	1.12	0.30	0.12	0.04	0.01
> 10,000 to 15,000	19	Crestline	7.03	2.28	1.49	0.99	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	Fontana	13.42	3.88	2.43	1.66	0.46	0.18	0.06	0.02
> 10,000 to 15,000	19	Indio	6.01	2.01	1.32	0.91	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	La Habra	7.96	2.69	1.73	1.15	0.30	0.12	0.04	0.01
> 10,000 to 15,000	19	Lake Elsinore	5.02	1.81	1.23	0.87	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	LAX	19.42	5.18	3.18	2.15	0.60	0.23	0.08	0.02
> 10,000 to 15,000	19	Long Beach	7.57	2.19	1.42	0.94	0.24	0.09	0.03	0.01
> 10,000 to 15,000	19	Lynwood	9.58	2.95	1.90	1.29	0.35	0.13	0.05	0.01
> 10,000 to 15,000	19	Mission Viejo	5.84	2.04	1.38	0.95	0.26	0.10	0.04	0.01
> 10,000 to 15,000	19	Palm Springs	7.10	2.01	1.25	0.83	0.22	0.09	0.03	0.01
> 10,000 to 15,000	19	Perris	7.43	2.19	1.37	0.94	0.27	0.11	0.04	0.01
> 10,000 to 15,000	19	Pico Rivera	12.06	3.38	2.09	1.40	0.37	0.14	0.05	0.01
> 10,000 to 15,000	19	Pomona	8.87	2.80	1.76	1.16	0.30	0.11	0.04	0.01
> 10,000 to 15,000	19	Redlands	6.41	2.40	1.61	1.11	0.30	0.12	0.05	0.01
> 10,000 to 15,000	19	Reseda	4.64	1.43	0.91	0.61	0.17	0.07	0.02	0.01
> 10,000 to 15,000	19	Riverside	9.55	2.96	1.94	1.34	0.37	0.14	0.05	0.01
> 10,000 to 15,000	19	San Bernardino	8.39	2.63	1.68	1.13	0.31	0.12	0.05	0.01
> 10,000 to 15,000	19	Santa Clarita	15.32	3.73	2.20	1.44	0.39	0.15	0.05	0.01
> 10,000 to 15,000	19	Upland	10.99	3.34	2.17	1.49	0.41	0.16	0.06	0.02
> 10,000 to 15,000	19	West LA	10.77	3.30	2.08	1.38	0.35	0.13	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.43
Dispersion Factors (χ/Q)
for Crematoriums
Operating More Than 12 Hours per Day

Building Area > 15,000 ft^2, Stack Height ≤ 19 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 15,000	19	Anaheim	14.87	4.07	2.53	1.68	0.43	0.16	0.06	0.01
> 15,000	19	Azusa	10.86	3.31	2.08	1.41	0.37	0.14	0.05	0.01
> 15,000	19	Banning	19.64	5.16	2.99	1.97	0.55	0.21	0.08	0.02
> 15,000	19	Burbank	9.91	2.67	1.65	1.07	0.26	0.09	0.03	0.01
> 15,000	19	Central LA	14.61	3.59	2.13	1.38	0.33	0.12	0.04	0.01
> 15,000	19	Compton	12.16	3.15	1.92	1.27	0.33	0.12	0.04	0.01
> 15,000	19	Costa Mesa	8.67	2.75	1.74	1.19	0.31	0.12	0.04	0.01
> 15,000	19	Crestline	8.49	2.43	1.55	1.03	0.27	0.10	0.04	0.01
> 15,000	19	Fontana	14.08	4.06	2.52	1.71	0.47	0.18	0.06	0.02
> 15,000	19	Indio	6.74	2.12	1.38	0.94	0.26	0.10	0.04	0.01
> 15,000	19	La Habra	9.51	2.88	1.82	1.21	0.30	0.12	0.04	0.01
> 15,000	19	Lake Elsinore	5.83	1.93	1.29	0.90	0.26	0.10	0.04	0.01
> 15,000	19	LAX	19.46	5.36	3.26	2.20	0.61	0.23	0.08	0.02
> 15,000	19	Long Beach	8.79	2.42	1.49	0.99	0.25	0.09	0.03	0.01
> 15,000	19	Lynwood	10.86	3.16	1.98	1.34	0.36	0.13	0.05	0.01
> 15,000	19	Mission Viejo	7.38	2.28	1.45	1.00	0.27	0.10	0.04	0.01
> 15,000	19	Palm Springs	7.28	2.04	1.26	0.84	0.22	0.09	0.03	0.01
> 15,000	19	Perris	7.77	2.27	1.41	0.96	0.27	0.11	0.04	0.01
> 15,000	19	Pico Rivera	13.57	3.65	2.19	1.46	0.38	0.14	0.05	0.01
> 15,000	19	Pomona	10.19	3.04	1.85	1.22	0.30	0.12	0.04	0.01
> 15,000	19	Redlands	7.82	2.66	1.70	1.16	0.31	0.12	0.05	0.01
> 15,000	19	Reseda	4.99	1.48	0.93	0.62	0.17	0.07	0.02	0.01
> 15,000	19	Riverside	10.70	3.17	2.02	1.39	0.38	0.15	0.05	0.01
> 15,000	19	San Bernardino	9.23	2.77	1.75	1.17	0.32	0.12	0.05	0.01
> 15,000	19	Santa Clarita	14.93	3.77	2.22	1.46	0.39	0.15	0.05	0.01
> 15,000	19	Upland	12.30	3.63	2.28	1.56	0.42	0.16	0.06	0.02
> 15,000	19	West LA	12.48	3.60	2.19	1.45	0.36	0.14	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 6.41
Dispersion Factors (χ/Q)
For Crematoriums
for Acute Hazard Index

All Operating Conditions χ/Q Values ([μg/m^3]/[lb/hr])

Building Area (ft)	Downwind Distance (meters)							
	25	50	75	100	200	300	500	1,000
≥ 5,000 to 10,000	815.20	207.53	136.57	99.22	39.06	18.35	9.23	4.96
> 10,000 to 15,000	777.72	201.21	133.26	99.04	41.36	18.92	9.24	4.96
> 15,000	687.14	193.36	131.64	99.25	41.15	19.00	9.24	4.96

*Note: Facilities with building dimensions outside these ranges must perform Tier 3 or 4 dispersion modeling

APPENDIX IX

TIER 2 SCREENING TABLES FOR SHORT-TERM PROJECTS FOR USE IN RULE 1401

Introduction

When performing a Tier 2 analysis for short-term projects (such as portable equipment, air pollution control equipment used for soil remediation projects, etc), the combined exposure factor and appropriate multi-pathway factor needs to be determined based on the duration of the project. The instructions on how to conduct a Tier 2 analysis are included in "Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0".

When conducting a Tier 2 analysis for short-term projects, you may also use the following equation using a **default exposure value (CEF):**

$$\mathbf{MICR_{(R,ST)} = CP \times Q_{tpy} \times \chi/Q \times CEF_{(R,ST)} \times MP_{(R,ST)} \times 10^{-6} \times MWAF}$$

$$\mathbf{MICR_{(W,ST)} = CP \times Q_{tpy} \times \chi/Q \times CEF_{(W,ST)} \times MP_{(W,ST)} \times WAF \times 10^{-6} \times MWAF}$$

Term	Description	Where to Find
Q_{tpy}	Maximum emission rate (tons/yr)	Emission estimate specific to permit unit
χ/Q	Concentration at a receptor distance / Emission Rate [(µg/m^3)/(tons/yr)]	Tables 2.1 thru 5.6
MWAF	Molecular Weight Adjustment Factor	Table 8.1
CP	Cancer Potency (mg/kg-day)$^{-1}$	Table 8.1
MP	Multipathway Factor (if applicable)	Table 8.11
CEF	Combined Exposure Factor	Tables 9.11 thru 9.32
WAF	Worker Adjustment Factor	Table 10.1
10^{-6}	Micrograms to milligrams conversion, liters to cubic meters conversion	not applicable

Please note that SCAQMD Engineering staff (http://www.aqmd.gov/contact/permitting-staff) should be consulted prior to the use of these exposure factors to determine if these factors are appropriate for the air quality permit application. Permit conditions limiting the duration of the use of equipment consistent with the analysis will be imposed, and information regarding the project duration will need to be well documented for the short-term projects.

Since these short-term calculations are only meant for projects with limits on the operating duration, these short-term cancer risk assessments can be thought of as being the equivalent to a 30-year cancer risk estimate and the appropriate thresholds would still apply (i.e. for a 5-year project, the maximum emissions during the 5-year period would be assessed on the more sensitive population, from the third trimester to age 5, after which the project's emissions would drop to 0 for the remaining 25 years to get the 30-year equivalent cancer risk estimate).

Table 8.11 - Multi-Pathway Factors for Short-Term Projects

		9 Year		5 Year		2 Year	
		Residential	**Worker**	**Residential**	**Worker**	**Residential**	**Worker**
POLID	POLABBREV	MP Ratio	MP Ratio	MP Ratio	MP Ratio	MP Ratio	MP Ratio
42397648	1,6-DiNPyrene	28.21	6.34	33.72	6.34	35.81	6.34
42397659	1,8-DiNPyrene	28.21	6.34	33.72	6.34	35.81	6.34
57653857	1-3,6-8HxCDD	16.00	7.27	39.91	7.27	46.38	7.27
57117449	1-3,6-8HxCDF	16.00	7.27	26.80	7.27	29.99	7.27
40321764	1-3,7,8PeCDD	16.00	7.27	39.91	7.27	46.38	7.27
57117416	1-3,7,8PeCDF	16.00	7.27	26.80	7.27	29.99	7.27
19408743	1-3,7-9HxCDD	16.00	7.27	39.91	7.27	46.38	7.27
72918219	1-3,7-9HxCDF	16.00	7.27	26.80	7.27	29.99	7.27
35822469	1-4,6-8HpCDD	16.00	7.27	39.91	7.27	46.38	7.27
67562394	1-4,6-8HpCDF	16.00	7.27	26.80	7.27	29.99	7.27
39227286	1-4,7,8HxCDD	16.00	7.27	39.91	7.27	46.38	7.27
70648269	1-4,7,8HxCDF	16.00	7.27	26.80	7.27	29.99	7.27
55673897	1-4,7-9HpCDF	16.00	7.27	26.80	7.27	29.99	7.27
3268879	1-8OctaCDD	16.00	7.27	39.91	7.27	46.38	7.27
39001020	1-8OctaCDF	16.00	7.27	26.80	7.27	29.99	7.27
5522430	1-Nitropyrene	28.21	6.34	33.72	6.34	35.81	6.34
1746016	2,3,7,8-TCDD	16.00	7.27	39.91	7.27	46.38	7.27
51207319	2,3,7,8-TCDF	16.00	7.27	26.80	7.27	29.99	7.27
60851345	2-4,6-8HxCDF	16.00	7.27	26.80	7.27	29.99	7.27
57117314	2-4,7,8PeCDF	16.00	7.27	26.80	7.27	29.99	7.27
607578	2-Nitrofluorene	28.21	6.34	33.72	6.34	35.81	6.34
56495	3-MeCholanthren	9.64	2.42	11.40	2.42	12.04	2.42
101779	4,4'-MeDianilin	9.79	2.41	9.52	2.41	9.20	2.41
57835924	4-Nitropyrene	28.21	6.34	33.72	6.34	35.81	6.34
3697243	5-MeChrysene	28.21	6.34	33.72	6.34	35.81	6.34
602879	5-NitroaceNapht	9.64	2.42	11.40	2.42	12.04	2.42
7496028	6-Nitrochrysene	28.21	6.34	33.72	6.34	35.81	6.34
57976	7,12-DB[a]anthr	9.64	2.42	11.40	2.42	12.04	2.42
194592	7H-D[c,g]carb	28.21	6.34	33.72	6.34	35.81	6.34
319846	alphaHexClCycHx	7.33	1.24	7.11	1.24	6.85	1.24

Table 8.11 - Multi-Pathway Factors for Short-Term Projects (continued)

		9 Year		5 Year		2 Year	
		Residential	**Worker**	**Residential**	**Worker**	**Residential**	**Worker**
POLID	POLABBREV	MP Ratio	MP Ratio	MP Ratio	MP Ratio	MP Ratio	MP Ratio
7440382	Arsenic	12.68	4.33	12.52	4.33	12.33	4.33
1016	As cmpd(inorg)	12.68	4.33	12.52	4.33	12.33	4.33
56553	B[a]anthracene	28.21	6.34	33.72	6.34	35.81	6.34
50328	B[a]P	28.21	6.34	33.72	6.34	35.81	6.34
205992	B[b]fluoranthen	28.21	6.34	33.72	6.34	35.81	6.34
205823	B[j]fluoranthen	28.21	6.34	33.72	6.34	35.81	6.34
207089	B[k]fluoranthen	28.21	6.34	33.72	6.34	35.81	6.34
10294403	Barium Chromate	1.78	1.02	1.75	1.02	1.73	1.02
319857	betaHexClCycHx	7.33	1.24	7.11	1.24	6.85	1.24
13765190	CalciumChromate	1.78	1.02	1.75	1.02	1.73	1.02
1333820	ChromiumTriOxid	1.78	1.02	1.75	1.02	1.73	1.02
218019	Chrysene	28.21	6.34	33.72	6.34	35.81	6.34
18540299	Cr(VI)	1.78	1.02	1.75	1.02	1.73	1.02
192654	D[a,e]pyrene	28.21	6.34	33.72	6.34	35.81	6.34
226368	D[a,h]acridine	28.21	6.34	33.72	6.34	35.81	6.34
53703	D[a,h]anthracen	9.64	2.42	11.40	2.42	12.04	2.42
189640	D[a,h]pyrene	28.21	6.34	33.72	6.34	35.81	6.34
189559	D[a,i]pyrene	28.21	6.34	33.72	6.34	35.81	6.34
224420	D[a,j]acridine	28.21	6.34	33.72	6.34	35.81	6.34
191300	D[a,l]pyrene	28.21	6.34	33.72	6.34	35.81	6.34
117817	Di2-EthHxPhthal	7.12	1.05	6.88	1.05	6.59	1.05
1080	DiBenFurans(Cl)	16.00	7.27	26.80	7.27	29.99	7.27
1086	Dioxins-w/o	16.00	7.27	39.91	7.27	46.38	7.27
608731	HexClCycHexanes	7.33	1.24	7.11	1.24	6.85	1.24
193395	In[1,2,3-cd]pyr	28.21	6.34	33.72	6.34	35.81	6.34
7439921	Lead	14.81	5.62	15.11	5.62	15.22	5.63
301042	Lead Acetate	14.81	5.62	15.11	5.62	15.22	5.63
7758976	Lead Chromate	1.78	1.02	1.75	1.02	1.73	1.02
1128	Lead cmp(inorg)	14.81	5.62	15.11	5.62	15.22	5.63
7446277	Lead Phosphate	14.81	5.62	15.12	5.62	15.22	5.62
1335326	Lead Subacetate	14.81	5.62	15.11	5.62	15.22	5.62
58899	Lindane	7.33	1.24	7.11	1.24	6.85	1.24
1151	PAHs-w/o	28.21	6.34	33.72	6.34	35.81	6.34

Table 8.11 - Multi-Pathway Factors for Short-Term Projects (continued)

		9 Year		5 Year		2 Year	
		Residential	Worker	Residential	Worker	Residential	Worker
POLID	POLABBREV	MP Ratio	MP Ratio	MP Ratio	MP Ratio	MP Ratio	MP Ratio
32598144	PCB 105	24.80	12.57	40.63	12.57	45.53	12.57
74472370	PCB 114	24.80	12.57	40.63	12.57	45.53	12.57
31508006	PCB 118	24.80	12.57	40.63	12.57	45.53	12.57
65510443	PCB 123	24.80	12.57	40.63	12.57	45.53	12.57
57465288	PCB 126	24.80	12.57	40.63	12.57	45.53	12.57
38380084	PCB 156	24.80	12.57	40.63	12.57	45.53	12.57
69782907	PCB 157	24.80	12.57	40.63	12.57	45.53	12.57
52663726	PCB 167	24.80	12.57	40.63	12.57	45.53	12.57
32774166	PCB 169	24.80	12.57	40.63	12.57	45.53	12.57
39635319	PCB 189	24.80	12.57	40.63	12.57	45.53	12.57
32598133	PCB 77	24.80	12.57	40.63	12.57	45.53	12.57
70362504	PCB 81	24.80	12.57	40.63	12.57	45.53	12.57
1336363	PCBs	24.80	12.57	24.55	12.57	24.25	12.57
10588019	SodiumDichromat	1.78	1.02	1.75	1.02	1.73	1.02
7789062	StrontiumChrom	1.78	1.02	1.75	1.02	1.73	1.02

Short-Term Projects – 2 years or Less in Duration

Table 9.11

Residential Short-Term (2-year) Combined Exposure Factor (CEF)

Age	Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	$CEF_{R,ST2}$
-0.25 to 0	361	10	0.25	1	0.96	310.99
0 to 2	1,090	10	2	1	0.96	

Table 9.12

Worker Short-Term (2-year) Combined Exposure Factor (CEF)

Age	Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	$CEF_{W,ST2}$
16 - 41	230	1	2	0.68	4.50

Short-Term Projects – 5 years or Less in Duration

Table 9.21

Residential Short-Term (5-year) Combined Exposure Factor (CEF)

Age	Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	$CEF_{R,ST5}$
-0.25 to 0	361	10	0.25	1	0.96	440.65
0 to 2	1,090	10	2	1	0.96	
2 to 5	631	3	5	1	0.96	

Table 9.22

Worker Short-Term (5-year) Combined Exposure Factor (CEF)

Age	Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	$CEF_{W,ST5}$
16 - 41	230	1	5	0.68	11.25

Short-Term Projects – 9 years or Less in Duration

Table 9.31
Residential Short-Term (9-year) Combined Exposure Factor (CEF)

Age	Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	$CEF_{R,ST9}$
-0.25 to 0	361	10	0.25	1	0.96	492.51
0 to 2	1,090	10	2	1	0.96	
2 to 9	631	3	7	1	0.96	

Table 9.32
Worker Short-Term (9-year) Combined Exposure Factor (CEF)

Age	Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	$CEF_{W,ST9}$
16 - 41	230	1	9	0.68	20.25

APPENDIX X

TIER 2 SCREENING TABLES
FOR GASOLINE TRANSFER AND DISPENSING FACILITIES
FOR USE IN RULE 1401

Note: This Appendix is currently in development and Gasoline Transfer and Dispensing Facilities should continue to use Risk Assessment Procedures for Rules 1401 and 212 and Attachment L, Version 7.0 (July 1, 2005) to evaluate the health risk impacts

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to estimate cancer risks from the industry-wide source category of retail gasoline dispensing facilities. The methods are consistent with (1) SCAQMD's risk assessment procedures for Rule 1401 and (2) California Air Pollution Control Officer Association (CAPCOA) risk assessment guidance for gasoline service stations. The methods used to estimate emissions, pollutant concentrations, and cancer risks are covered here. Tables of maximum cancer risks at various locations in the South Coast Air Basin and at various residential and occupational distances are provided. The appendix concludes with an example calculation using the cancer risk tables.

Emission Inventory Methods

Rule 461 currently has annual throughput reporting requirements. It is designed to regulate gasoline vapor emissions from gasoline transfer and dispensing processes which contain volatile organic compounds (VOCs) and TACs such as benzene, ethylbenzene, toluene, xylenes, and naphthalene. The rule was initially adopted in 1976 and has been amended a number of times, most recently on March 7, 2008. Therefore, risk from these facilities can be calculated from the available information.

Emissions from gasoline transfer and dispensing mainly occur during loading, breathing, refueling, and spillage as described below:

Loading – Emissions occur when a fuel tanker truck unloads gasoline to the storage tanks. The storage tank vapors, displaced during loading, are emitted through its vent pipe. A pressure/vacuum valve installed on the tank vent pipe significantly reduces these emissions.

Breathing – Emissions occur through the storage tank vent pipe as a result of temperature and pressure changes in the tank vapor space.

Refueling – Emissions occur during motor vehicle refueling when gasoline vapors escape through the vehicle/nozzle interface.

Spillage – Emissions occur from evaporating gasoline that spills during vehicle refueling.

All retail service stations under SCAQMD jurisdiction have Phase I and II vapor recovery systems to control gasoline emissions. Phase I vapor recovery refers to the collection of gasoline vapors displaced from storage tanks when cargo tank trucks make gasoline deliveries. Phase II vapor recovery systems control the vapors displaced from the vehicle fuel tanks during refueling. In addition, all gasoline is stored underground with valves installed on the tank vent pipes to further control gasoline emissions. Out of the toxic compounds emitted from the gasoline stations, benzene, ethylbenzene, and naphthalene have cancer toxicity values.

The control efficiencies and emission factors for each of the four processes are summarized in Table X-1. The factors given in the table follow the CAPCOA recommended guidelines except that 95 percent control is assumed for Phase II vapor recovery, whereas CAPCOA assumes 90 percent control due to incomplete compliance.

Table X-1. Gasoline and Benzene Emission Factors for Retail Service Stations

Process		Loading	Breathing	Refueling	Spillage
Controlled Gasoline EF (lbs/1,000 gal)		0.42	0.025	0.32	0.24
Control Efficiency		95%	75%	96%	N/A
Benzene	**Weight Percent**	0.30%	0.30%	0.30%	1.00%
	Emission Factor (lbs/1,000 gal)	0.00126	0.000075	0.00096	0.0024
Ethyl benzene	**Weight Percent**	0.118%	0.118%	0.118%	1.640%
	Emission Factor (lbs/1,000 gal)	0.0004956	0.0000295	0.0003776	0.003936
Naphthalene	**Weight Percent**	0.0%	0.0%	0.0%	0.14%
	Emission Factor (lbs/1,000 gal)	0.0	0.0	0.0	0.0003288

Note: Although the gasoline speciation profile is 0.36 wt% for benzene, a value of 0.30 wt% was used to be consistent with CAPCOA

Exposure Modeling Methods

Air quality modeling was performed using an air quality dispersion model, called AERMOD (American Meteorological Society/U.S. EPA Regulatory Model). As of December 9, 2006, U.S. EPA promulgated AERMOD as a replacement for ISCST3 (Industrial Source Complex – Short Term, Version 3) as the recommended dispersion model. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

AERMOD was executed using the urban option, which is SCAQMD policy for all permitting in its jurisdiction. The U.S. EPA regulatory defaults options are implemented and the SCAQMD AERMOD-ready meteorological data was used. The County populations used are based on the 2008 estimates from the U.S. Census Bureau. The Los Angeles County population was

9,862,049; Orange County population was 3,010,759; Riverside County population was 2,100,516; and San Bernardino County population was 2,015355.

Emissions from gasoline service stations are non-buoyant and ground-based (or nearly ground-based). In addition, the peak impacts from this type of facility occur in close proximity to the source. Under these circumstances the local terrain is relatively unimportant; therefore flat terrain is assumed in the dispersion modeling.

As mentioned earlier, CAPCOA has developed industry-wide risk assessment guidelines for gasoline service stations (CAPCOA, 1997). These guidelines were developed to promote consistency throughout the State. However, CAPCOA recognized that many of the districts in the State have developed modeling methods and procedures unique to their situations. To address these differences among districts, CAPCOA allows for a district to deviate from the published guidelines as evidenced by the following statement in the industry-wide risk assessment guidelines for gas stations (CAPCOA, 1997):

> *This effort was initiated to provide a cost effective and uniform method for calculating gasoline station emission inventories and risk assessment for the thousands of gasoline stations throughout the State. However, districts may use other emission information and modeling procedures appropriate in their district.*

The modeling performed here followed CAPCOA guidelines unless otherwise noted.

Modeling was performed using AERMOD, which is the U.S. EPA recommended model for dispersion modeling, instead of ISCST3.

Loading and breathing emissions exit the underground storage tank vent pipe and are thus treated as a point source. The height and diameter of the vent are assumed to be 3.66 meters (12 feet) and 0.05 meters (2 inches), respectively.

Refueling and spillage emissions are modeled as volume sources with horizontal dimensions of 13 meters by 13 meters to correspond to the dimensions of the pump islands and a vertical dimension of 5 meters to correspond to the height of the canopy. For refueling, the release height is assumed to be 1 meter to approximate the height of a vehicle fuel tank inlet, whereas spillage emissions are assumed to be released at ground level since nearly all the gasoline from spillage reaches the ground. These dimensions match CAPCOA's recommendations except for the vertical dimension of the volume source; CAPCOA recommends 4 meters. The SCAQMD has been requiring gas station risk assessments for permitting since early 1990s using a vertical dimension of the volume source corresponding to the pump island canopy top. Assuming a 5-meter vertical dimension continues this modeling practice.

According to the CAPCOA guidelines, the effects of building downwash on the calculated cancer risk were determined by using three different scenarios with a 10 meter long by 5 meter wide, by 4 meter high building. The building downwash algorithms only affect point sources and do not affect volume or area sources. Results of the modeling indicated that the placement of the buildings and their subsequent potential to create downwash have very little effect on the resultant risks from the vent pipes. Thus, it was concluded that it is not necessary to include building downwash when determining the dispersion from the vent pipes. In order to determine the effects of building downwash using AERMOD, a similar analysis was conducted with the same building dimensions using the BPIP computer program. The modeling results showed that building downwash caused the maximum ground level concentrations to more than double. Therefore, building downwash has a significant effect on the maximum concentrations and subsequent cancer risk and cannot be ignored.

The vent pipe, volume sources, and building are assumed to be located at the center of the service station property. Ideally, the locations of the vent pipes, pump islands, and buildings would be determined on a site by site basis. Unfortunately, that level of detail is not feasible for the industry-wide risk assessment presented here due to the large number of facilities.

It is assumed that the gas station described above operates continuously throughout the year. Further, it is assumed that 80 percent of the daily emissions occur equally each hour from 6 a.m. to 8 p.m. and the remaining 20 percent of the daily emissions occur equally each hour from 8 p.m. to 6 a.m.

A sample AERMOD model input file for the generic retail service station described above is given in Exhibit X-1.

Modeling was performed at 26 SCAQMD meteorological stations shown in Figure X-1. The locations of each of the sites are given in Table X-2. The data are available on the SCAQMD website (http://aqmd.gov/smog/metdata/AERMOD.html). A polar receptor grid is assumed at ten degree azimuth increments at the following downwind distances: 20, 25, 30, 40, 50, 60, 70, 80, 90, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, and 1000 meters.

The peak model-predicted impacts at each downwind distance over the 36 azimuth angles are used to develop the screening risk tables for gasoline service stations (see Tables X-4 to X-9).

Figure X-1: Meteorological Monitoring Stations in the South Coast Air Basin

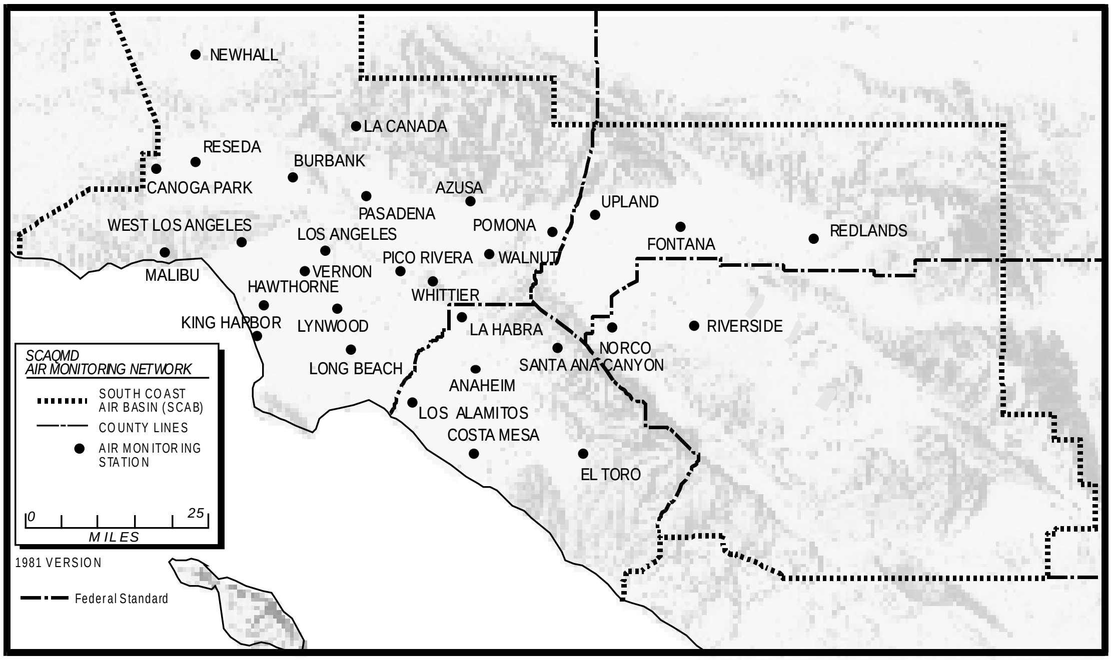


Table X-2: Locations of Meteorological Stations and Elevations

	UTM Coordinates (km)		Lat./Long. Coordinates		Eleva tion
Station name	**Easting**	**Northing**	**Latitude**	**Longitude**	**(m)**
Anaheim	413.14	3743.57	33:49:50	117:56:19	41
Azusa	414.81	3777.47	34:08:11	117:55:26	182
Banning	513.10	3753.19	33:55:15	116:51:30	660
Burbank	378.62	3782.24	34:10:33	118:19:01	175
Central LA	386.79	3770.00	34:03:59	118:13:36	87
Costa Mesa	414.16	3726.19	33:40:26	117:55:33	20
Crestline	474.62	3788.76	34:14:29	117:16:32	1387
Fontana	454.62	3773.19	34:06:01	117:29:31	367
Indio	572.67	3729.90	33:42:30	116:12:57	-4
La Habra	411.98	3754.08	33:55:31	117:57:08	82
Lake Elsinore	469.33	3726.13	33:40:35	117:19:51	406
LAX	367.83	3757.80	33:57:15	118:25:49	42
Long Beach	389.99	3743.04	33:49:25	118:11:19	30
Lynwood	388.07	3754.73	33:55:44	118:12:39	29
Mission Viejo	437.39	3721.17	33:37:49	117:40:30	170
Palm Springs	542.46	3745.73	33:51:10	116:32:28	171
Perris	478.91	3738.58	33:47:20	117:13:40	442
Pico Rivera	401.31	3763.61	34:00:37	118:04:07	58
Pomona	430.78	3769.61	34:04:00	117:45:00	270
Redlands	486.36	3768.50	34:03:32	117:08:52	481
Reseda	358.76	3785.11	34:11:57	118:31:58	228
Riverside	461.64	3762.10	34:00:02	117:24:55	250
San Bernardino	474.76	3773.82	34:06:24	117:16:25	305
Santa Clarita	359.48	3805.52	34:23:00	118:31:42	375
Upland	441.96	3773.66	34:06:14	117:37:45	379
West LA	365.54	3768.52	34:03:02	118:27:24	97

Exhibit X-1: AERMOD Model Input File for a Generic Gasoline Service Station

```
CO STARTING
   TITLEONE SCAQMD R461 SCREEN TABLE PREPARATION
   TITLETWO Template - Underground, 10mX5mX4m building in middle
   MODELOPT CONC
   AVERTIME ANNUAL
   POLLUTID Any
   RUNORNOT RUN
   ERRORFIL ERRORS.OUT
CO URBANOPT 9862049 LAC
CO FINISHED

SO STARTING
   LOCATION P1 POINT     0.0    0.0    0.0
   LOCATION P2 POINT     0.0    0.0    0.0
   LOCATION P3 POINT     0.0    0.0    0.0
   LOCATION P4 POINT     0.0    0.0    0.0

   LOCATION V1 VOLUME    0.0    0.0    0.0
   LOCATION V2 VOLUME    0.0    0.0    0.0
   LOCATION V3 VOLUME    0.0    0.0    0.0
   LOCATION V4 VOLUME    0.0    0.0    0.0
   LOCATION V5 VOLUME    0.0    0.0    0.0

** Point Source     Q       RelHgt   Temp     Vel     Dia
**              ----------  ------  ------  -------  -----
   SRCPARAM P1  1.8123E-05  3.660    291.0  0.00035  0.051
   SRCPARAM P2  1.0787E-06  3.660    289.0  0.00011  0.051
   SRCPARAM P3  7.1283E-06  3.660    291.0  0.00035  0.051
   SRCPARAM P4  4.2431E-07  3.660    289.0  0.00011  0.051


** Volume Source     Q       RelHgt  Syinit  Szinit
**               ----------  ------  ------  ------
   SRCPARAM V1   1.3808E-05    1.00    3.02    2.33
   SRCPARAM V2   3.4520E-05    0.00    3.02    2.33
   SRCPARAM V3   5.4311E-06    1.00    3.02    2.33
   SRCPARAM V4   5.6613E-05    0.00    3.02    2.33
   SRCPARAM V5   4.7292E-06    0.00    3.02    2.33

   BUILDHGT P1          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1          4.00     4.00     4.00     4.00     4.00     4.00

   BUILDHGT P2          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2          4.00     4.00     4.00     4.00     4.00     4.00

   BUILDHGT P3          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3          4.00     4.00     4.00     4.00     4.00     4.00

   BUILDHGT P4          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4          4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4          4.00     4.00     4.00     4.00     4.00     4.00
```

```
   BUILDHGT P4          4.00     4.00     4.00     4.00     4.00     4.00

   BUILDWID P1          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P1         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P1         10.87    10.26     9.33     8.12     6.66     5.00
   BUILDWID P1          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P1         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P1         10.87    10.26     9.33     8.12     6.66     5.00

   BUILDWID P2          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P2         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P2         10.87    10.26     9.33     8.12     6.66     5.00
   BUILDWID P2          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P2         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P2         10.87    10.26     9.33     8.12     6.66     5.00

   BUILDWID P3          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P3         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P3         10.87    10.26     9.33     8.12     6.66     5.00
   BUILDWID P3          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P3         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P3         10.87    10.26     9.33     8.12     6.66     5.00

   BUILDWID P4          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P4         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P4         10.87    10.26     9.33     8.12     6.66     5.00
   BUILDWID P4          6.66     8.12     9.33    10.26    10.87    11.16
   BUILDWID P4         11.11    10.72    10.00    10.72    11.11    11.16
   BUILDWID P4         10.87    10.26     9.33     8.12     6.66     5.00

   BUILDLEN P1         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P1          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P1         10.26    10.87    11.16    11.11    10.72    10.00
   BUILDLEN P1         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P1          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P1         10.26    10.87    11.16    11.11    10.72    10.00

   BUILDLEN P2         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P2          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P2         10.26    10.87    11.16    11.11    10.72    10.00
   BUILDLEN P2         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P2          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P2         10.26    10.87    11.16    11.11    10.72    10.00

   BUILDLEN P3         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P3          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P3         10.26    10.87    11.16    11.11    10.72    10.00
   BUILDLEN P3         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P3          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P3         10.26    10.87    11.16    11.11    10.72    10.00

   BUILDLEN P4         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P4          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P4         10.26    10.87    11.16    11.11    10.72    10.00
   BUILDLEN P4         10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P4          8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P4         10.26    10.87    11.16    11.11    10.72    10.00

   XBADJ    P1         -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P1         -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P1         -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P1         -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P1         -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P1         -5.13    -5.44    -5.58    -5.55    -5.36    -5.00

   XBADJ    P2         -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P2         -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P2         -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P2         -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
```

```
XBADJ    P2          -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
XBADJ    P2          -5.13    -5.44    -5.58    -5.55    -5.36    -5.00

XBADJ    P3          -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
XBADJ    P3          -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
XBADJ    P3          -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
XBADJ    P3          -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
XBADJ    P3          -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
XBADJ    P3          -5.13    -5.44    -5.58    -5.55    -5.36    -5.00

XBADJ    P4          -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
XBADJ    P4          -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
XBADJ    P4          -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
XBADJ    P4          -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
XBADJ    P4          -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
XBADJ    P4          -5.13    -5.44    -5.58    -5.55    -5.36    -5.00

YBADJ    P1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P1           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P1           0.00     0.00     0.00     0.00     0.00     0.00

YBADJ    P2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P2           0.00     0.00     0.00     0.00     0.00     0.00

YBADJ    P3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P3           0.00     0.00     0.00     0.00     0.00     0.00

YBADJ    P4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P4           0.00     0.00     0.00     0.00     0.00     0.00

URBANSRC P1
URBANSRC P2
URBANSRC P3
URBANSRC P4
URBANSRC V1
URBANSRC V2
URBANSRC V3
URBANSRC V4
URBANSRC V5

EMISFACT P1 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P1 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
EMISFACT P1 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
EMISFACT P1 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
EMISFACT P2 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P2 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
EMISFACT P2 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
EMISFACT P2 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
EMISFACT V1 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V1 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
EMISFACT V1 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
EMISFACT V1 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
EMISFACT V2 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V2 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
```

```
   EMISFACT V2 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V2 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
   EMISFACT P3 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P3 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT P3 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT P3 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
   EMISFACT P4 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P4 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT P4 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT P4 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
   EMISFACT V3 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V3 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V3 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V3 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
   EMISFACT V4 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V4 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V4 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V4 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48
   EMISFACT V5 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V5 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V5 HROFDY 1.371 1.371 1.371 1.371 1.371 1.371
   EMISFACT V5 HROFDY 1.371 1.371 0.48 0.48 0.48 0.48

   SRCGROUP P1 P1
   SRCGROUP P2 P2
   SRCGROUP P3 P3
   SRCGROUP P4 P4
   SRCGROUP V1 V1
   SRCGROUP V2 V2
   SRCGROUP V3 V3
   SRCGROUP V4 V4
   SRCGROUP V5 V5
SO FINISHED

RE STARTING
   GRIDPOLR POL1 STA
                 ORIG     0.0     0.0
                 DIST 20 25 30 40 50 60 70 75 80 90 100 125 150 175 200 250
                 DIST 300 350 400 450 500 600 700 800 900 1000
                 GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED

ME STARTING
   SURFFILE WSLA.SFC
   PROFFILE WSLA.PFL
   SURFDATA 0    2005
   UAIRDATA 3190 2005
   PROFBASE 0    METERS
ME FINISHED

OU STARTING
   RECTABLE  ALLAVE  FIRST
   PLOTFILE  ANNUAL  P1         UM1P1.TXT
   PLOTFILE  ANNUAL  P2         UM1P2.TXT
   PLOTFILE  ANNUAL  P3         UM1P3.TXT
   PLOTFILE  ANNUAL  P4         UM1P4.TXT
   PLOTFILE  ANNUAL  V1         UM1V1.TXT
   PLOTFILE  ANNUAL  V2         UM1V2.TXT
   PLOTFILE  ANNUAL  V3         UM1V3.TXT
   PLOTFILE  ANNUAL  V4         UM1V4.TXT
   PLOTFILE  ANNUAL  V5         UM1V5.TXT
OU FINISHED
```

Risk Assessment Methods

The risk assessment methods used in the SCAQMD's *Risk Assessment Procedures for Rule 1401 and 212 (Version 7.0)* are used to calculate the cancer risks from retail gasoline service stations. The cancer risk (CR) is calculated as follows:

$$CR = \text{Cancer Potency (CP)} \bullet \text{Dose-Inhalation (DI)} \bullet \text{Multipathway Factor (MP)}$$

where,

$$DI = C_{air} \bullet DBR \bullet EVF \bullet 10^{-6} \bullet MP$$

$$C_{air} = C_{ann} \bullet AF_{ann}$$

Therefore, the equation for calculating cancer risks is:

$$CR = CP \bullet C_{ann} \bullet AF_{ann} \bullet DBR \bullet EVF \bullet 10^{-6} \bullet MP$$

CP is cancer potency in units of $(mg/kg\text{-}day)^{-1}$. The inhalation cancer potency for benzene is $0.1(mg/kg\text{-}day)^{-1}$, $0.0087(mg/kg\text{-}day)^{-1}$ for ethylbenzene, and $0.12(mg/kg\text{-}day)^{-1}$ for naphthalene. C_{ann} is the model-predicted annual average benzene concentration in $\mu g/m^3$. AF_{ann} is a concentration adjustment factor. It adjusts the model-predicted annual average benzene concentration, which are 24 hrs/day and 7 days/week averages, to an average for the off-site worker exposure period (i.e., 8 hrs/day and 5 days/week). This is necessary because the worker breathing rate of 149 L/kg-day is only applicable to the work-day and work-week exposure. It is assumed that the worker is only exposed while at work. Since the generic gasoline service station is assumed to operate continuously, AF_{ann} is assumed to be 1 for both worker and residential receptors.

DBR is the daily breathing rate in units of L/kg-day. The daily breathing rates for workers and residents are 149 L/kg-day and 302 L/kg-day, respectively. EVF is the exposure value factor, which is assumed to be 0.38 for workers and 0.96 for residents. The multi-pathway adjustment factor (MP) is used for substances that may contribute to risk from exposures other than inhalation. Inhalation is the only pathway into the body for benzene, ethylbenzene, and naphthalene; therefore, the multipathway factor is 1.

Risk Tables

Applying the methods and equations presented above, screening risk tables were developed for a generic retail gasoline service station. The modeled stations are assumed to have Phase I and II vapor recovery with cancer risk calculated for different locations; see Table X-1 for the control efficiencies and emission factors assumed for the modeling.

Cancer risks from a typical gasoline service station can be estimated from the screening tables as follows: First, determine which of the 26 locations in these tables is closest to the gas station or best represents the facility. SCAQMD staff made use of location information that is available in the SCAQMD's permit database. The SCAQMD is broken up into 38 source/receptor areas as shown in Figure X-2. The source/receptor area is provided for each facility in SCAQMD's permit database. As shown in Table X-3, SCAQMD staff assigned one of the 26 meteorological sites to each source receptor area, which was then used to choose a meteorological site for each gasoline dispensing facility.

Next, determine the distance from the service station to the nearest residential and occupational location. Tables X-4 to X-9 provide the maximum cancer risk for a gasoline dispensing station with either underground or aboveground tanks with a one million gallon per year throughput at various residential and occupational distances, respectively. The various meteorological correction factors are also provided to adjust the cancer risk estimates to the SRA where the project is located. Using the above information, pick the cancer risk from the appropriate tables. Lastly, scale the cancer risk by the actual gasoline throughput of the service station. An example of a risk calculation is provided for a hypothetical gasoline service station in a subsequent section.

Figure X-2: Source Receptor Areas

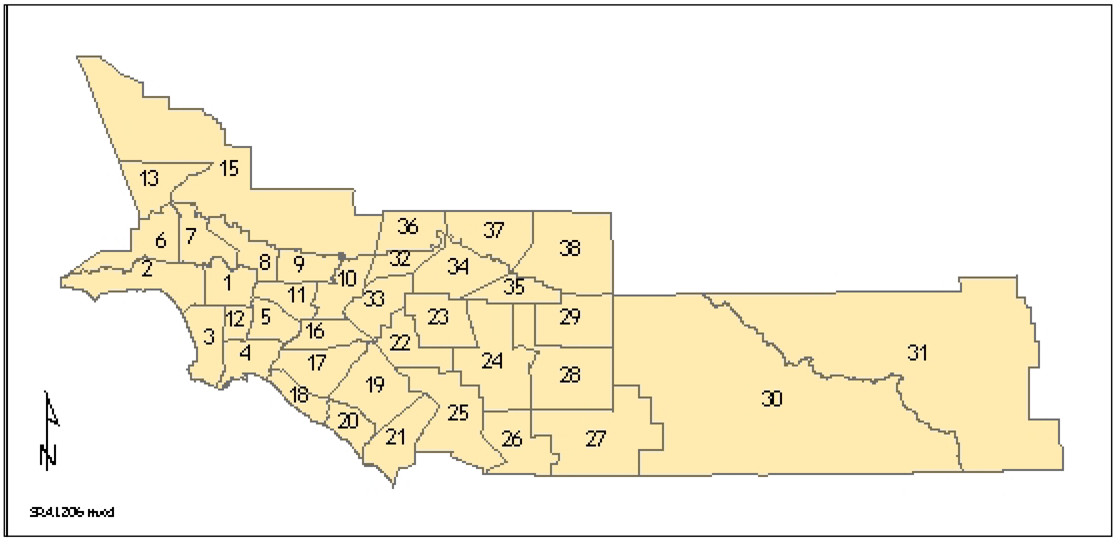


Table X-3: Meteorological Stations for Each Source Receptor Area

Meteorological Station	Source Receptor Area	Meteorological Station	Source Receptor Area
Anaheim	17	Lynwood	12
Azusa	8, 9	Mission Viejo	19, 21
Banning	29	Perris	24, 28
Burbank	7	Palm Springs	30, 31
Central LA	1	Pico Rivera	5, 11
Crestline	37	Pomona	10
Costa Mesa	18, 20	Redlands	35, 38
Fontana	34	Reseda	6
Indio	30	Riverside	22, 23
La Habra	16	Santa Clarita	13, 15
Lake Elsinore	25, 26, 27	San Bernardino	34
LAX	3	Upland	32, 33, 36
Long Beach	4	West LA	2

Table X-4: Residential MICR – Underground Tanks per One Million Gallons of Gasoline

Distance (m)	**20**	**25**	**30**	**40**	**50**	**60**	**70**	**75**	**80**
MICR	5.600	4.000	3.004	1.866	1.278	0.940	0.722	0.636	0.572
Distance (m)	**90**	**100**	**125**	**150**	**175**	**200**	**250**	**300**	**350**
MICR	0.462	0.381	0.248	0.174	0.125	0.095	0.060	0.044	0.034
Distance (m)	**400**	**450**	**500**	**600**	**700**	**800**	**900**	**1000**	-
MICR	0.027	0.022	0.018	0.014	0.011	0.009	0.007	0.006	-

Table X-5: Commercial MICR – Underground Tanks per One Million Gallons of Gasoline

Distance (m)	**20**	**25**	**30**	**40**	**50**	**60**	**70**	**75**	**80**
MICR	1.094	0.781	0.587	0.364	0.250	0.184	0.141	0.124	0.112
Distance (m)	**90**	**100**	**125**	**150**	**175**	**200**	**250**	**300**	**350**
MICR	0.090	0.074	0.049	0.034	0.024	0.018	0.012	0.009	0.007
Distance (m)	**400**	**450**	**500**	**600**	**700**	**800**	**900**	**1000**	-
MICR	0.005	0.004	0.004	0.003	0.002	0.002	0.001	0.001	-

Table X-6: Meteorological Correction Factors (MET) for Underground Tanks by Source Receptor Area (SRA)

SRA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
MET	0.86	1.00	0.90	1.04	0.80	0.95	0.89	1.04	1.04	1.14	0.08	1.18	0.70
SRA	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
MET	0.70	0.96	0.91	1.08	0.71	1.08	0.71	0.91	0.91	0.81	0.79	0.79	0.79
SRA	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**-**	**-**
MET	0.81	0.83	1.00	1.00	1.05	1.05	1.06	1.35	1.05	1.01	1.35	-	-

Table X-7: Residential MICR – Aboveground Tanks per One Million Gallons of Gasoline

Distance (m)	20	25	30	40	50	60	70	75	80
MICR	5.440	3.896	2.931	1.823	1.249	0.919	0.706	0.622	0.559
Distance (m)	90	100	125	150	175	200	250	300	350
MICR	0.452	0.372	0.242	0.169	0.120	0.091	0.058	0.044	0.032
Distance (m)	400	450	500	600	700	800	900	1000	-
MICR	0.026	0.021	0.018	0.013	0.010	0.008	0.007	0.006	-

Table X-8: Commercial MICR – Aboveground Tanks per One Million Gallons of Gasoline

Distance (m)	20	25	30	40	50	60	70	75	80
MICR	1.062	0.761	0.572	0.356	0.244	0.179	0.138	0.121	0.109
Distance (m)	90	100	125	150	175	200	250	300	350
MICR	0.088	0.073	0.047	0.033	0.024	0.018	0.011	0.008	0.006
Distance (m)	400	450	500	600	700	800	900	1000	-
MICR	0.005	0.004	0.003	0.003	0.002	0.002	0.001	0.001	-

Table X-9: Meteorological Correction Factors (MET) for Aboveground Tanks by Source Receptor Area (SRA)

SRA	1	2	3	4	5	6	7	8	9	10	11	12	13
MET	0.86	1.00	0.90	1.05	0.80	0.95	0.89	1.04	1.04	1.14	0.80	1.18	0.70
SRA	15	16	17	18	19	20	21	22	23	24	25	26	27
MET	0.70	0.96	0.90	1.08	0.70	1.08	0.70	0.91	0.91	0.81	0.79	0.79	0.79
SRA	28	29	30	31	32	33	34	35	36	37	38	-	-
MET	0.81	0.83	1.00	1.00	1.04	1.04	1.06	1.36	1.04	1.01	1.36	-	-

Results

Figure X-3 shows the species apportionment and Figure X-4 shows the source apportionment of the calculated cancer risks. Using the results from the West LA meteorological station and at a distance of 20 meters, emissions from spillage account for 48% of the cancer risk, while benzene is the TAC which drives the risk, accounting for 87%. This is consistent with the discussion of the relative toxicity of substances in gasoline found in Appendix I of the CAPCOA document, which shows that benzene is the most important substance driving the risk in the gasoline service stations.

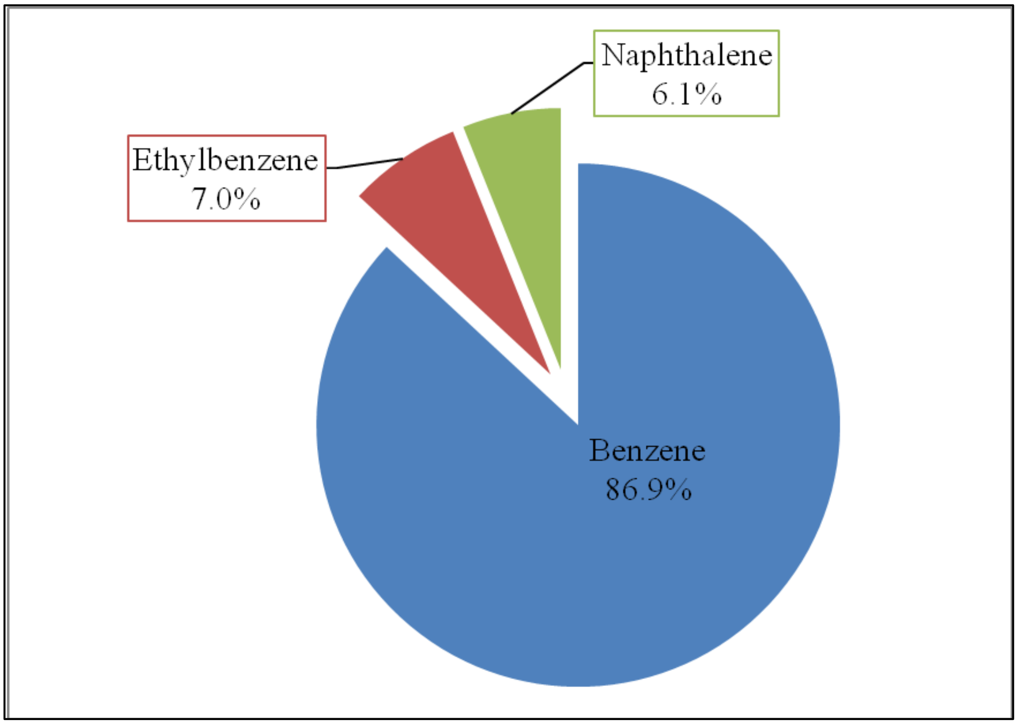
According to the CARB speciation profile of gasoline (both vapor and liquid), SCAQMD reviewed the most recent consolidated table of health values for risk assessments published by OEHHA and found that for non-cancer health effects, the following toxic compounds were analyzed:

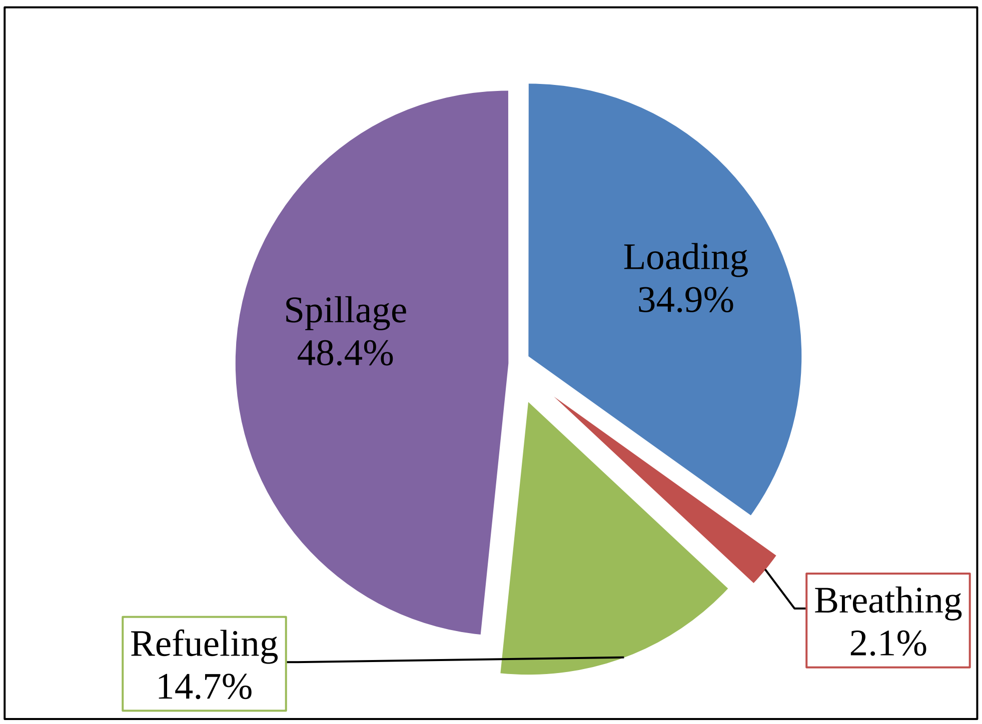
Chronic HI: benzene, ethylbezene, toluene, xylene, naphthalene, n-hexane, and methanol

Acute HI: benzene, toluene, xylene and methanol.

The results show that for the maximum permitted risk of 10 in a million, the Hazard Index for acute and chronic are insignificant (< 0.1). Therefore, the chronic and acute non-cancer health effects need not be calculated, which is consistent with CAPCOA's guidelines.

Figure X-3: Species Apportionment





Example Calculations

The following example demonstrates how the SCAQMD staff plans to assign health risk values for retail gasoline dispensing facilities based on information received and using Tables C-3 and C-4.

The calculation steps are as follows:

1. **Cancer Risk (CR):** The SCAQMD will assign cancer risk values to each retail gasoline dispensing facility based on facility location, process information, and receptor proximity.
   a. *Residential CR:* Use the facility location and the distance to the nearest resident to identify the risk. The residential CRs for retail gasoline dispensing are contained in Table C-3.
   b. *Occupational CR:* Use the facility location and the distance to the nearest worker to identify the risk. The occupational CRs for retail gasoline dispensing are contained in Table C-4.
   c. *Maximum Individual CR (MICR):* Select the greater CR between the residential and occupational CRs (as identified above).

Please note the following when calculating risk values for gasoline dispensing facilities:

- The gasoline dispensing risk tables (Tables C-3 and C-4) are based on a gasoline throughput of 1 million (MM) gallons per year (gal/yr). Actual facility throughput should be multiplied by the values contained in the gasoline dispensing risk tables to calculate the appropriate facility risk.
- The SCAQMD maintains 26 meteorological stations as shown in Figure C-1. If there are no meteorological stations in the city of the facility, the closest meteorological station to the facility should be used.
- The gasoline dispensing risk tables (Tables C-3 and C-4) are based on discrete downwind distances, which cover two pages. If the actual downwind distance is not listed in the tables, then linear interpolation between distance cells is acceptable.
- Although gasoline vapors and its TAC constituents (for example, benzene, toluene, and xylene) have non-cancer impacts, **the risks from retail gasoline dispensing facilities are dominated by cancer risk**. Therefore, hazard index for these facilities will not be calculated.

Example: **A retail gasoline dispensing facility submits the following information: 15 MM gal/yr gasoline throughput, located in Pomona, nearest residential receptor 250 meters away, and nearest occupational receptor 25 meters away.**

In this example the actual downwind distances are in the tables. However, if the actual downwind distances are not in the table, then linear interpolation between distance cells is acceptable to obtain cancer risks for the actual downwind distances.

1. **Cancer Risk (CR):**

   a. *Residential CR:* Using Table C-3, the residential cancer risk is 0.065 in one million (250 meters and Pomona) for 1 MM gal/yr. Since the facility's gasoline throughput for this example is 15 MM gal/yr, the corresponding residential cancer risk is 0.98 in one million.

   $$\textbf{Residential CR} = \frac{0.065 \text{ in one million}}{(1 \text{ MM gal/yr})} \times (15 \text{ MM gal/yr})$$

Residential CR = 0.98 in one million

   a. *Occupational CR:* Using Table C-4, the occupational cancer risk is 0.784 in one million (25 meters and Pomona) for 1 MM gal/yr. Since the facility's gasoline throughput for this example is 15 MM gal/yr, the corresponding occupational cancer risk is 11.8 in one million.

   $$\textbf{Occupational CR (GDS)} = \frac{0.784 \text{ in one million}}{(1 \text{ MM gal/yr})} \times (15 \text{ MM gal/yr})$$

Occupational CR = 11.8 in one million

   b. *MICR:* The MICR for this IWS facility (GDS) is **11.8** in one million (occupational receptor).

APPENDIX XI

TIER 2 SCREENING TABLES
FOR SPRAY BOOTHS
FOR USE IN RULE 1401

Note: This Appendix is currently in development and Spray Booths should continue to use Risk Assessment Procedures for Rules 1401 and 212 and Attachment L, Version 7.0 (July 1, 2005) to evaluate the health risk impacts

ATTACHMENTS

PERMIT APPLICATION PACKAGES
INCLUDING TABLES

(Note: Attachment M,
EFFECTIVE FOR APPLICATIONS DEEMED COMPLETE
ON OR AFTER July 5, 2015)

South Coast Air Quality Management District

DRAFT PERMIT APPLICATION PACKAGE "M"

For Use in Conjunction with the
RISK ASSESSMENT PROCEDURES
for Rules 1401, 1401.1, and 212
Version 8.0

Revised June 5, 2015

PERMIT APPLICATION PACKAGE "M"
used in conjunction with the
RISK ASSESSMENT PROCEDURES
FOR RULES 1401, 1401.1, AND 212, VERSION 8.0
EFFECTIVE FOR APPLICATIONS DEEMED COMPLETE
ON OR AFTER July 5, 2015

Table 1.1	Screening Emission Levels
Table 2.1	Dispersion Factors (χ/Q) for Point Source Equipment Operating 12 Hours per Day or Less, Stack Height ≥ 14 ft to 24 ft
Table 2.2	Dispersion Factors (χ/Q) for Point Source Equipment Operating 12 Hours per Day or Less, Stack Height > 24 ft to 49 ft
Table 2.3	Dispersion Factors (χ/Q) for Point Source Equipment Operating 12 Hours per Day or Less, Stack Height > 49 ft
Table 3.1	Dispersion Factors (χ/Q) for Point Source Equipment Operating More Than 12 Hours per Day, Stack Height ≥ 14 ft to 24 ft
Table 3.2	Dispersion Factors (χ/Q) for Point Source Equipment Operating More Than 12 Hours per Day, Stack Height > 24 ft to 49 ft
Table 3.3	Dispersion Factors (χ/Q) for Point Source Equipment Operating More Than 12 Hours per Day, Stack Height > 49 ft
Table 4.1	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day or Less, Building Area ≤ 3,000 ft^2, Height ≤ 20 ft
Table 4.2	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day or Less, Building Area > 3,000 to 10,000 ft^2, Height ≤ 20 ft
Table 4.3	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day or Less, Building Area > 3,000 to 10,000 ft^2, Height > 20 ft
Table 4.4	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day or Less, Building Area > 10,000 to 30,000 ft^2, Height ≤ 20 ft
Table 4.5	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day or Less, Building Area > 10,000 to 30,000 ft^2, Height > 20 ft
Table 4.6	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day or Less, Building Area > 30,000 ft^2, Height > 20 ft
Table 5.1	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day, Building Area ≥ 3,000 ft^2, Height ≤ 20 ft
Table 5.2	Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day, Building Area > 3,000 to 10,000 ft^2, Height ≤ 20 ft

Table 5.3 Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day, Building Area > 3,000 to 10,000 ft^2, Height > 20 ft

Table 5.4 Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day, Building Area > 10,000 to 30,000 ft^2, Height $\leq$ 20 ft

Table 5.5 Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day, Building Area > 10,000 to 30,000 ft^2, Height > 20 ft

Table 5.6 Dispersion Factors (χ/Q) for Volume Source Equipment Operating 12 Hours per Day, Building Area > 30,000 ft^{2,} Height > 20 ft

Table 6.1 Dispersion Factors (χ/Q) for Acute Hazard Index Point Source Equipment

Table 7.1 Dispersion Factors (χ/Q) for Acute Hazard Index Volume Source Equipment

Table 8.1 Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

Table 9.1 Residential Combined Exposure Factor (CEF)

Table 9.2 Worker Combined Exposure Factor (CEF)

Table 10.1 Worker Adjustment Factor Operating 12 Hours per Day or Less

Table 10.2 Worker Adjustment Factor Operating More Than 12 Hours per Day

Table 11.1 Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Table 11.2 Target Organs Affected by Toxic Air Contaminants (Acute Toxicity)

Table 11.3 Target Organs Affected by Toxic Air Contaminants (8-hour Toxicity)

Table 12.1 Meteorological Monitoring Stations in the South Coast Air Basin

Table 12.2 Meteorological Stations for Each Source/Receptor Area

Figure 1 Meteorological Monitoring Stations in the South Coast Air Basin (Map)

Figure 2 Source/Receptor Areas

Table – 1.1
Screening Emission Levels

THESE ARE NOT EMISSION LIMITS. Exceedances of these levels indicate that a screening health risk assessment should be performed.

Date Toxicity Criteria Last Updated				Pollutant		Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Cancer	Chronic	8-hr Chronic	Acute	Toxic Air Contaminant	CAS No	Emissions at 25 m (lb/yr)	Emissions at 50 m (lb/yr)	Emissions at 100 m (lb/yr)	Emissions at 25 m, (lb/hr)	Emissions at 50 m, (lb/hr)	Emissions at 100 m, (lb/hr)
4/99[5/93]	12/19/08	12/19/08	12/19/08	Acetaldehyde	75-07-0	5.66E+00 (ca)	1.72E+01 (ca)	3.51E+01 (ca)	5.37E-01	1.40E+00	2.09E+00
4/1/99				Acetamide	60-35-5	8.08E-01 (ca)	2.45E+00 (ca)	5.01E+00 (ca)			
	12/19/08	12/19/08	12/19/08	Acrolein	107-02-8	6.25E+00 (8hr)	2.91E+01 (8hr)	8.31E+01 (ch)	2.86E-03	7.45E-03	1.11E-02
4/99[7/90]				Acrylamide	79-06-1	1.26E-02 (ca)	3.82E-02 (ca)	7.80E-02 (ca)			
			4/1/99	Acrylic Acid	79-10-7				6.85E+00	1.79E+01	2.67E+01
4/99[1/91]	12/1/01			Acrylonitrile	107-13-1	5.66E-02 (ca)	1.72E-01 (ca)	3.51E-01 (ca)			
4/1/99				Allyl Chloride	107-05-1	2.69E+00 (ca)	8.18E+00 (ca)	1.67E+01 (ca)			
4/1/99				2-Aminoanthraquinone	117-79-3	1.71E+00 (ca)	5.21E+00 (ca)	1.06E+01 (ca)			
	2/1/00		4/1/99	Ammonia	7664-41-7	7.66E+03 (ch)	2.33E+04 (ch)	4.75E+04 (ch)	3.66E+00	9.53E+00	1.43E+01
4/1/99				Aniline	62-53-3	9.93E+00 (ca)	3.01E+01 (ca)	6.16E+01 (ca)			
7/1/90	12/19/08	12/19/08	12/19/08	Arsenic and Compounds (Inorganic)	7440-38-2	4.86E-04 (ca)	1.47E-03 (ca)	3.01E-03 (ca)	2.28E-04	5.96E-04	8.91E-04
	12/19/08	12/19/08	12/19/08	Arsine	7784-42-1	1.34E-01 (8hr)	6.24E-01 (8hr)	1.96E+00 (8hr)	2.28E-04	5.96E-04	8.91E-04
3/1/86				Asbestos	1332-21-4	7.72E-07 (ca)	2.34E-06 (ca)	4.78E-06 (ca)			
1/1/85	6/27/14	6/27/14	6/27/14	Benzene	71-43-2	5.66E-01 (ca)	1.72E+00 (ca)	3.51E+00 (ca)	3.08E-02	8.04E-02	1.20E-01
4/99[1/91]				Benzidine (and Its Salts)	92-87-5	1.13E-04 (ca)	3.44E-04 (ca)	7.02E-04 (ca)			
4/99[1/91]				Benzidine Based Dyes	1020	1.13E-04 (ca)	3.44E-04 (ca)	7.02E-04 (ca)			
4/99[1/91]				Direct Black	1937-37-7	1.13E-04 (ca)	3.44E-04 (ca)	7.02E-04 (ca)			
4/99[1/91]				Direct Blue	2602-46-2	1.13E-04 (ca)	3.44E-04 (ca)	7.02E-04 (ca)			
4/99[1/91]				Direct Brown (Technical Grade)	16071-86-6	1.13E-04 (ca)	3.44E-04 (ca)	7.02E-04 (ca)			
4/1/99			4/1/99	Benzyl Chloride	100-44-7	3.33E-01 (ca)	1.01E+00 (ca)	2.06E+00 (ca)	2.74E-01	7.15E-01	1.07E+00
4/99[7/90]	12/1/01			Beryllium and Compounds	7440-41-7	6.74E-03 (ca)	2.05E-02 (ca)	4.18E-02 (ca)			
4/1/99				Bis(2-Chloroethyl)Ether (Dichloroethyl Ether)	111-44-4	2.26E-02 (ca)	6.87E-02 (ca)	1.40E-01 (ca)			
4/99[1/91]				Bis(Chloromethyl)Ether	542-88-1	1.23E-03 (ca)	3.74E-03 (ca)	7.63E-03 (ca)			
4/99[10/93]				Potassium Bromate	7758-01-2	1.15E-01 (ca)	3.51E-01 (ca)	7.16E-01 (ca)			
7/1/92	7/29/13	7/29/13	7/29/13	1,3-Butadiene	106-99-0	9.43E-02 (ca)	2.86E-01 (ca)	5.85E-01 (ca)	7.54E-01	1.97E+00	2.94E+00
1/1/87	1/1/01			Cadmium and Compounds	7440-43-9	3.77E-03 (ca)	1.15E-02 (ca)	2.34E-02 (ca)			
	5/13/02		4/1/99	Carbon Disulfide	75-15-0	3.06E+04 (ch)	9.30E+04 (ch)	1.90E+05 (ch)	7.08E+00	1.85E+01	2.76E+01
9/1/87	1/1/01		4/1/99	Carbon Tetrachloride (Tetrachloromethane)	56-23-5	3.77E-01 (ca)	1.15E+00 (ca)	2.34E+00 (ca)	2.17E+00	5.66E+00	8.47E+00
4/1/99				Chlorinated Paraffins	108171-26-2	6.36E-01 (ca)	1.93E+00 (ca)	3.94E+00 (ca)			
	2/1/00		4/1/99	Chlorine	7782-50-5	7.66E+00 (ch)	2.33E+01 (ch)	4.75E+01 (ch)	2.40E-01	6.25E-01	9.36E-01
	1/1/01			Chlorine Dioxide	10049-04-4	2.30E+01 (ch)	6.98E+01 (ch)	1.42E+02 (ch)			
4/1/99				4-Chloro-o-Phenylenediamine	95-83-0	3.54E+00 (ca)	1.07E+01 (ca)	2.19E+01 (ca)			
	1/1/01			Chlorobenzene	108-90-7	3.83E+04 (ch)	1.16E+05 (ch)	2.37E+05 (ch)			
12/1/90	4/1/00		4/1/99	Chloroform	67-66-3	2.98E+00 (ca)	9.04E+00 (ca)	1.85E+01 (ca)	1.71E-01	4.47E-01	6.68E-01
4/1/99				Pentachlorophenol	87-86-5	3.14E+00 (ca)	9.55E+00 (ca)	1.95E+01 (ca)			
4/99[1/91]				2,4,6-Trichlorophenol	88-06-2	8.08E-01 (ca)	2.45E+00 (ca)	5.01E+00 (ca)			
	12/1/01		4/1/99	Chloropicrin	76-06-2	1.53E+01 (ch)	4.65E+01 (ch)	9.50E+01 (ch)	3.31E-02	8.64E-02	1.29E-01
4/1/99				p-Chloro-o-Toluidine	95-69-2	2.10E-01 (ca)	6.36E-01 (ca)	1.30E+00 (ca)			
1/1/86	1/1/01			Chromium 6+	18540-29-9	6.95E-05 (ca)	2.11E-04 (ca)	4.31E-04 (ca)			
1/1/86	1/1/01			Barium Chromate	10294-40-3	3.38E-04 (ca)	1.03E-03 (ca)	2.10E-03 (ca)			
1/1/86	1/1/01			Calcium Chromate	13765-19-0	2.09E-04 (ca)	6.33E-04 (ca)	1.29E-03 (ca)			
1/1/86	1/1/01			Lead Chromate	7758-97-6	4.32E-04 (ca)	1.31E-03 (ca)	2.68E-03 (ca)			
1/1/86	1/1/01			Sodium Dichromate	10588-01-9	1.75E-04 (ca)	5.31E-04 (ca)	1.09E-03 (ca)			
1/1/86	1/1/01			Strontium Chromate	7789-06-2	2.72E-04 (ca)	8.26E-04 (ca)	1.69E-03 (ca)			

Table – 1.1 (continued)
Screening Emission Levels

Date Toxicity Criteria Last Updated				Pollutant		Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Cancer	Chronic	8-hr Chronic	Acute	Toxic Air Contaminant	CAS No	Emissions at 25 m (lb/yr)	Emissions at 50 m (lb/yr)	Emissions at 100 m (lb/yr)	Emissions at 25 m, (lb/hr)	Emissions at 50 m, (lb/hr)	Emissions at 100 m, (lb/hr)
1/1/86	1/1/01			Chromic Trioxide (as Chromic Acid Mist)	1333-82-0	1.34E-04 (ca)	4.06E-04 (ca)	8.28E-04 (ca)			
			4/1/99	Copper and Compounds	7440-50-8				1.14E-01	2.98E-01	4.46E-01
4/1/99				p-Cresidine	120-71-8	3.77E-01 (ca)	1.15E+00 (ca)	2.34E+00 (ca)			
	1/1/01			Cresols (Mixtures of)	1319-77-3	2.30E+04 (ch)	6.98E+04 (ch)	1.42E+05 (ch)			
	1/1/01			m-Cresol	108-39-4	2.30E+04 (ch)	6.98E+04 (ch)	1.42E+05 (ch)			
	1/1/01			o-Cresol	95-48-7	2.30E+04 (ch)	6.98E+04 (ch)	1.42E+05 (ch)			
	1/1/01			p-Cresol	106-44-5	2.30E+04 (ch)	6.98E+04 (ch)	1.42E+05 (ch)			
4/1/99				Cupferron	135-20-6	2.57E-01 (ca)	7.81E-01 (ca)	1.59E+00 (ca)			
	4/1/00		4/1/99	Hydrogen Cyanide (Hydrocyanic Acid)	74-90-8	3.45E+02 (ch)	1.05E+03 (ch)	2.14E+03 (ch)	3.88E-01	1.01E+00	1.51E+00
4/1/99				2,4-Diaminoanisole	615-05-4	2.46E+00 (ca)	7.47E+00 (ca)	1.53E+01 (ca)			
4/1/99				2,4-Diaminotoluene	95-80-7	1.41E-02 (ca)	4.30E-02 (ca)	8.77E-02 (ca)			
4/99[1/92]				1,2-Dibromo-3-Chloropropane (DBCP)	96-12-8	8.08E-03 (ca)	2.45E-02 (ca)	5.01E-02 (ca)			
4/99[1/91]	1/1/01			p-Dichlorobenzene	106-46-7	1.41E+00 (ca)	4.30E+00 (ca)	8.77E+00 (ca)			
4/99[1/91]				3,3-Dichlorobenzidine	91-94-1	4.72E-02 (ca)	1.43E-01 (ca)	2.92E-01 (ca)			
4/1/99				1,1,-Dichloroethane (Ethylidene Dichloride)	75-34-3	9.93E+00 (ca)	3.01E+01 (ca)	6.16E+01 (ca)			
4/99[1/92]				Di(2-Ethylhexyl)Phthalate (DEHP)	117-81-7	1.29E+00 (ca)	3.92E+00 (ca)	8.00E+00 (ca)			
	12/1/01			Diethanolamine	111-42-2	1.15E+02 (ch)	3.49E+02 (ch)	7.12E+02 (ch)			
4/1/99				p-Dimethylaminoazobenzene	60-11-7	1.23E-02 (ca)	3.74E-02 (ca)	7.63E-02 (ca)			
	1/1/01			N,N-Dimethyl Formamide	68-12-2	3.06E+03 (ch)	9.30E+03 (ch)	1.90E+04 (ch)			
4/1/99				2,4-Dinitrotoluene	121-14-2	1.83E-01 (ca)	5.54E-01 (ca)	1.13E+00 (ca)			
4/99[1/91]	4/1/00		4/1/99	1,4-Dioxane (1,4-Diethylene Dioxide)	123-91-1	2.10E+00 (ca)	6.36E+00 (ca)	1.30E+01 (ca)	3.43E+00	8.93E+00	1.34E+01
1/1/88				1,2-Diphenylhydrazine {Hydrazobenzene}	122-66-7	6.47E-02 (ca)	1.96E-01 (ca)	4.01E-01 (ca)			
4/99[1/92]	1/1/01		4/1/99	Epichlorohydrin (1-Chloro-2,3-Epoxypropane)	106-89-8	7.07E-01 (ca)	2.15E+00 (ca)	4.39E+00 (ca)	1.48E+00	3.87E+00	5.79E+00
	1/1/01			1,2-Epoxybutane	106-88-7	7.66E+02 (ch)	2.33E+03 (ch)	4.75E+03 (ch)			
11/7/07	2/1/00			Ethyl Benzene	100-41-4	6.50E+00 (ca)	1.97E+01 (ca)	4.03E+01 (ca)			
	4/1/00			Ethyl Chloride (Chloroethane)	75-00-3	1.15E+06 (ch)	3.49E+06 (ch)	7.12E+06 (ch)			
7/1/85	12/1/01			Ethylene Dibromide (1,2-Dibromoethane)	106-93-4	2.26E-01 (ca)	6.87E-01 (ca)	1.40E+00 (ca)			
9/1/85	1/1/01			Ethylene Dichloride (1,2-Dichloroethane)	107-06-2	7.86E-01 (ca)	2.39E+00 (ca)	4.87E+00 (ca)			
	4/1/00			Ethylene Glycol	107-21-1	1.53E+04 (ch)	4.65E+04 (ch)	9.50E+04 (ch)			
11/1/87	1/1/01			Ethylene Oxide (1,2-Epoxyethane)	75-21-8	1.83E-01 (ca)	5.54E-01 (ca)	1.13E+00 (ca)			
4/1/99				Ethylene Thiourea	96-45-7	1.26E+00 (ca)	3.82E+00 (ca)	7.80E+00 (ca)			
	8/14/03		4/1/99	Flourides	1101	8.73E+01 (ch)	2.65E+02 (ch)	5.41E+02 (ch)	2.74E-01	7.15E-01	1.07E+00
	8/14/03		4/1/99	Hydrogen Fluoride (Hydrofluoric Acid)	7664-39-3	8.84E+01 (ch)	2.68E+02 (ch)	5.48E+02 (ch)	2.74E-01	7.15E-01	1.07E+00
3/1/92	12/19/08	12/19/08	12/19/08	Formaldehyde	50-00-0	2.69E+00 (ca)	8.18E+00 (ca)	1.67E+01 (ca)	6.28E-02	1.64E-01	2.45E-01
	1/1/01			Glutaraldehyde	111-30-8	3.06E+00 (ch)	9.30E+00 (ch)	1.90E+01 (ch)			
			4/1/99	Ethylene Glycol Butyl Ether – EGBE	111-76-2				1.60E+01	4.17E+01	6.24E+01
	2/1/00		4/99[1/92]	Ethylene Glycol Ethyl Ether – EGEE	110-80-5	2.68E+03 (ch)	8.14E+03 (ch)	1.66E+04 (ch)	4.23E-01	1.10E+00	1.65E+00
	2/1/00		4/1/99	Ethylene Glycol Ethyl Ether Acetate – EGEEA	111-15-9	1.15E+04 (ch)	3.49E+04 (ch)	7.12E+04 (ch)	1.60E-01	4.17E-01	6.24E-01
	2/1/00		4/1/99	Ethylene Glycol Methyl Ether – EGME	109-86-4	2.30E+03 (ch)	6.98E+03 (ch)	1.42E+04 (ch)	1.06E-01	2.77E-01	4.14E-01

Table – 1.1 (continued)
Screening Emission Levels

Date Toxicity Criteria Last Updated				Pollutant		Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Cancer	Chronic	8-hr Chronic	Acute	Toxic Air Contaminant	CAS No	Emissions at 25 m (lb/yr)	Emissions at 50 m (lb/yr)	Emissions at 100 m (lb/yr)	Emissions at 25 m, (lb/hr)	Emissions at 50 m, (lb/hr)	Emissions at 100 m, (lb/hr)
	2/1/00			Ethylene Glycol Methyl Ether Acetate – EGMEA	110-49-6	3.45E+03 (ch)	1.05E+04 (ch)	2.14E+04 (ch)			
4/99[1/91]				Hexachlorobenzene	118-74-1	3.14E-02 (ca)	9.55E-02 (ca)	1.95E-01 (ca)			
4/99[1/91]				Hexachlorocyclohexanes	608-73-1	2.63E-03 (ca)	7.97E-03 (ca)	1.63E-02 (ca)			
4/99[1/91]				Alpha-Hexachlorocyclohexane	319-84-6	2.63E-03 (ca)	7.97E-03 (ca)	1.63E-02 (ca)			
4/99[1/91]				Beta- Hexachlorocyclohexane	319-85-7	2.63E-03 (ca)	7.97E-03 (ca)	1.63E-02 (ca)			
4/1/1999				Gamma-Hexachlorocyclohexane (Lindane)	58-89-9	9.55E-03 (ca)	2.90E-02 (ca)	5.92E-02 (ca)			
	4/1/00			n-Hexane	110-54-3	2.68E+05 (ch)	8.14E+05 (ch)	1.66E+06 (ch)			
4/99[7/90]	1/1/01			Hydrazine	302-01-2	3.33E-03 (ca)	1.01E-02 (ca)	2.06E-02 (ca)			
	2/1/00		4/1/99	Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	3.45E+02 (ch)	1.05E+03 (ch)	2.14E+03 (ch)	2.40E+00	6.25E+00	9.36E+00
	4/1/00		4/99[7/90]	Hydrogen Sulfide	7783-06-4	3.83E+02 (ch)	1.16E+03 (ch)	2.37E+03 (ch)	4.80E-02	1.25E-01	1.87E-01
	12/1/01			Isophorone	78-59-1	7.66E+04 (ch)	2.33E+05 (ch)	4.75E+05 (ch)			
	2/1/00		4/1/99	Isopropyl Alcohol (Isopropanol)	67-63-0	2.68E+05 (ch)	8.14E+05 (ch)	1.66E+06 (ch)	3.66E+00	9.53E+00	1.43E+01
4/1/97				Lead and Compounds (Inorganic)	7439-92-1	1.18E-01 (ca)	3.58E-01 (ca)	7.32E-01 (ca)			
4/1/97				Lead Acetate	301-04-2	1.85E-01 (ca)	5.63E-01 (ca)	1.15E+00 (ca)			
4/1/97				Lead Phosphate	7446-27-7	1.54E-01 (ca)	4.68E-01 (ca)	9.56E-01 (ca)			
4/1/97				Lead Subacetate	1335-32-6	1.53E-01 (ca)	4.66E-01 (ca)	9.51E-01 (ca)			
	12/1/01			Maleic Anhydride	108-31-6	2.68E+01 (ch)	8.14E+01 (ch)	1.66E+02 (ch)			
	12/19/08	12/19/08		Manganese and Compounds	7439-96-5	1.52E+00 (8hr)	7.08E+00 (8hr)	2.14E+01 (ch)			
	12/19/08	12/19/08	12/19/08	Mercury and Compounds (Inorganic)	7439-97-6	2.97E-01 (ch)	9.03E-01 (ch)	1.84E+00 (ch)	6.85E-04	1.79E-03	2.67E-03
				Methyl Mercury*	593-74-8						
	12/19/08	12/19/08	12/19/08	Mercuric Chloride	7487-94-7	2.97E-01 (ch)	9.03E-01 (ch)	1.84E+00 (ch)	6.85E-04	1.79E-03	2.67E-03
	4/1/00		4/1/99	Methanol	67-56-1	1.53E+05 (ch)	4.65E+05 (ch)	9.50E+05 (ch)	3.20E+01	8.34E+01	1.25E+02
	2/1/00		4/1/99	Methyl Bromide (Bromomethane)	74-83-9	1.91E+02 (ch)	5.81E+02 (ch)	1.19E+03 (ch)	4.45E+00	1.16E+01	1.74E+01
11/1/99	2/1/00			Methyl Tertiary-Butyl Ether	1634-04-4	3.14E+01 (ca)	9.55E+01 (ca)	1.95E+02 (ca)			
	2/1/00		4/1/99	Methyl Chloroform (1,1,1-Trichloroethane)	71-55-6	3.83E+04 (ch)	1.16E+05 (ch)	2.37E+05 (ch)	7.77E+01	2.03E+02	3.03E+02
			4/1/99	Methyl Ethyl Ketone (2-Butanone)	78-93-3				1.48E+01	3.87E+01	5.79E+01
	12/1/01			Methyl Isocyanate	624-83-9	3.83E+01 (ch)	1.16E+02 (ch)	2.37E+02 (ch)			
4/1/99				4,4'-Methylene Bis (2-Chloroaniline) (MOCA)	101-14-4	3.77E-02 (ca)	1.15E-01 (ca)	2.34E-01 (ca)			
7/1/89	2/1/00		4/1/99	Methylene Chloride (Dichloromethane)	75-09-2	1.62E+01 (ca)	4.91E+01 (ca)	1.00E+02 (ca)	1.60E+01	4.17E+01	6.24E+01
4/1/99	12/1/01			4,4'-Methylene Dianiline (and Its Dichloride)	101-77-9	4.90E-03 (ca)	1.49E-02 (ca)	3.04E-02 (ca)			
	1/1/01			Methylene Diphenyl Isocyanate	101-68-8	2.68E+01 (ch)	8.14E+01 (ch)	1.66E+02 (ch)			
4/1/99				Michler's Ketone (4,4'-Bis(Dimethylamino)Benzophenone)	90-94-8	6.58E-02 (ca)	2.00E-01 (ca)	4.08E-01 (ca)			
4/99[1/92]				n-Nitrosodi-n-Butylamine	924-16-3	5.14E-03 (ca)	1.56E-02 (ca)	3.19E-02 (ca)			
4/99[1/91]				n-Nitrosodi-n-Propylamine	621-64-7	8.08E-03 (ca)	2.45E-02 (ca)	5.01E-02 (ca)			
4/99[1/91]				n-Nitrosodiethylamine	55-18-5	1.57E-03 (ca)	4.77E-03 (ca)	9.75E-03 (ca)			
4/99[1/91]				n-Nitrosodimethylamine	62-75-9	3.54E-03 (ca)	1.07E-02 (ca)	2.19E-02 (ca)			
4/1/99				n-Nitrosodiphenylamine	86-30-6	6.29E+00 (ca)	1.91E+01 (ca)	3.90E+01 (ca)			
4/99[7/90]				n-Nitroso-n-Methylethylamine	10595-95-6	2.57E-03 (ca)	7.81E-03 (ca)	1.59E-02 (ca)			
10/1/87				n-Nitroso-n-Methylurea	684-93-5	4.75E-04 (ca)	1.44E-03 (ca)	2.95E-03 (ca)			
10/1/87				n-Nitroso-n-Ethylurea	759-73-9	2.10E-03 (ca)	6.36E-03 (ca)	1.30E-02 (ca)			
4/99[7/92]				n-Nitrosomorpholine	59-89-2	8.45E-03 (ca)	2.56E-02 (ca)	5.24E-02 (ca)			
4/99[7/92]				n-Nitrosopiperidine	100-75-4	6.02E-03 (ca)	1.83E-02 (ca)	3.73E-02 (ca)			
4/99[7/90]				n-Nitrosopyrrolidine	930-55-2	2.69E-02 (ca)	8.18E-02 (ca)	1.67E-01 (ca)			

Table – 1.1 (continued)
Screening Emission Levels

Date Toxicity Criteria Last Updated				Pollutant		Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Cancer	Chronic	8-hr Chronic	Acute	Toxic Air Contaminant	CAS No	Emissions at 25 m (lb/yr)	Emissions at 50 m (lb/yr)	Emissions at 100 m (lb/yr)	Emissions at 25 m, (lb/hr)	Emissions at 50 m, (lb/hr)	Emissions at 100 m, (lb/hr)
8/1/91	3/23/12	3/23/12	3/23/12	Nickel and Compounds	7440-02-0	6.22E-02 (ca)	1.89E-01 (ca)	3.86E-01 (ca)	2.28E-04	5.96E-04	8.91E-04
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Acetate	373-02-4	1.87E-01 (ca)	5.69E-01 (ca)	1.16E+00 (ca)	6.88E-04	1.79E-03	2.68E-03
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Carbonate	3333-67-3	1.26E-01 (ca)	3.82E-01 (ca)	7.80E-01 (ca)	4.62E-04	1.20E-03	1.80E-03
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Carbonyl	13463-39-3	1.81E-01 (ca)	5.49E-01 (ca)	1.12E+00 (ca)	6.64E-04	1.73E-03	2.59E-03
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Hydroxide	12054-48-7	9.82E-02 (ca)	2.98E-01 (ca)	6.09E-01 (ca)	3.61E-04	9.41E-04	1.41E-03
8/1/91	3/23/12	3/23/12	3/23/12	Nickelocene	1271-28-9	1.26E-01 (ca)	3.82E-01 (ca)	7.81E-01 (ca)	4.63E-04	1.21E-03	1.81E-03
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Oxide	1313-99-1	7.91E-02 (ca)	2.40E-01 (ca)	4.91E-01 (ca)	2.91E-04	7.58E-04	1.13E-03
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Refinery Dust (Pyrometallurgical Process)	1146	6.22E-02 (ca)	1.89E-01 (ca)	3.86E-01 (ca)	2.28E-04	5.96E-04	8.91E-04
8/1/91	3/23/12	3/23/12	3/23/12	Nickel Subsulfide	12035-72-2	2.55E-01 (ca)	7.73E-01 (ca)	1.58E+00 (ca)	9.35E-04	2.44E-03	3.65E-03
			4/1/99	Nitric Acid	7697-37-2				9.82E-02	2.56E-01	3.83E-01
4/1/99				p-Nitrosodiphenylamine	156-10-5	2.57E+00 (ca)	7.81E+00 (ca)	1.59E+01 (ca)			
8/1/98	8/1/98			Particulate Emissions From Diesel-Fueled Engines	9901	5.14E-02 (ca)	1.56E-01 (ca)	3.19E-01 (ca)			
10/1/91	10/1/91		4/1/99	Perchloroethylene (Tetrachloroethylene)	127-18-4	2.69E+00 (ca)	8.18E+00 (ca)	1.67E+01 (ca)	2.28E+01	5.96E+01	8.91E+01
	4/1/00		4/1/99	Phenol	108-95-2	7.66E+03 (ch)	2.33E+04 (ch)	4.75E+04 (ch)	6.63E+00	1.73E+01	2.58E+01
			4/1/99	Phosgene	75-44-5				4.57E-03	1.19E-02	1.78E-02
	9/3/02			Phosphine	7803-51-2	3.06E+01 (ch)	9.30E+01 (ch)	1.90E+02 (ch)			
	2/1/00			Phosphoric Acid	7664-38-2	2.68E+02 (ch)	8.14E+02 (ch)	1.66E+03 (ch)			
	1/1/01			Phthalic Anhydride	85-44-9	7.66E+02 (ch)	2.33E+03 (ch)	4.75E+03 (ch)			
4/1/99	8/29/03			PCB (Polychlorinated Biphenyls)	1336-36-3	6.28E-05 (ch)	1.91E-04 (ch)	3.89E-04 (ch)			
8/29/03	8/29/03			3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	32598-13-3	1.58E-04 (ca)	4.79E-04 (ca)	9.79E-04 (ca)			
1/31/11	1/31/11			3,4,4',5-Tetrachlorobiphenyl (PCB 81)	70362-50-4	5.26E-05 (ca)	1.60E-04 (ca)	3.26E-04 (ca)			
1/31/11	1/31/11			2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	32598-14-4	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
1/31/11	1/31/11			2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	74472-37-0	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
1/31/11	1/31/11			2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	31508-00-6	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
1/31/11	1/31/11			2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	65510-44-3	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
8/29/03	8/29/03			3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	57465-28-8	1.58E-07 (ca)	4.79E-07 (ca)	9.79E-07 (ca)			
1/31/11	1/31/11			2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	38380-08-4	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
1/31/11	1/31/11			2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	69782-90-7	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
1/31/11	1/31/11			2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	52663-72-6	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
1/31/11	1/31/11			3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	32774-16-6	5.26E-07 (ca)	1.60E-06 (ca)	3.26E-06 (ca)			
1/31/11	1/31/11			2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	39635-31-9	5.26E-04 (ca)	1.60E-03 (ca)	3.26E-03 (ca)			
8/1/86	2/1/00			Polychlorinated Dibenzo-p-Dioxins (PCDD)	1086	1.69E-08 (ca)	5.14E-08 (ca)	1.05E-07 (ca)			
8/1/86	2/1/00			2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1746-01-6	1.69E-08 (ca)	5.14E-08 (ca)	1.05E-07 (ca)			
8/1/03	8/1/03			1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	40321-76-4	1.69E-08 (ca)	5.14E-08 (ca)	1.05E-07 (ca)			
4/1/99	2/1/00			1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	39227-28-6	1.69E-07 (ca)	5.14E-07 (ca)	1.05E-06 (ca)			

Table – 1.1 (continued)
Screening Emission Levels

Date Toxicity Criteria Last Updated				Pollutant		Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Cancer	Chronic	8-hr Chronic	Acute	Toxic Air Contaminant	CAS No	Emissions at 25 m (lb/yr)	Emissions at 50 m (lb/yr)	Emissions at 100 m (lb/yr)	Emissions at 25 m, (lb/hr)	Emissions at 50 m, (lb/hr)	Emissions at 100 m, (lb/hr)
4/1/99	2/1/00			1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	57653-85-7	1.69E-07 (ca)	5.14E-07 (ca)	1.05E-06 (ca)			
4/1/99	2/1/00			1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	19408-74-3	1.69E-07 (ca)	5.14E-07 (ca)	1.05E-06 (ca)			
4/1/99	2/1/00			1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	35822-46-9	1.69E-06 (ca)	5.14E-06 (ca)	1.05E-05 (ca)			
1/31/11	1/31/11			1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3268-87-9	5.64E-05 (ca)	1.71E-04 (ca)	3.50E-04 (ca)			
8/1/86	2/1/00			Polychlorinated Dibenzofurans (PCDF)	1080	2.39E-08 (ca)	7.27E-08 (ca)	1.48E-07 (ca)			
4/1/99	2/1/00			2,3,7,8-Tetrachlorodibenzofuran	5120-73-19	2.39E-07 (ca)	7.27E-07 (ca)	1.48E-06 (ca)			
1/31/11	1/31/11			1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	7.98E-07 (ca)	2.42E-06 (ca)	4.95E-06 (ca)			
1/31/11	1/31/11			2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	7.98E-08 (ca)	2.42E-07 (ca)	4.95E-07 (ca)			
4/1/99	2/1/00			1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	2.39E-07 (ca)	7.27E-07 (ca)	1.48E-06 (ca)			
4/1/99	2/1/00			1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	2.39E-07 (ca)	7.27E-07 (ca)	1.48E-06 (ca)			
4/1/99	2/1/00			1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	2.39E-07 (ca)	7.27E-07 (ca)	1.48E-06 (ca)			
4/1/99	2/1/00			2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	2.39E-07 (ca)	7.27E-07 (ca)	1.48E-06 (ca)			
4/1/99	2/1/00			1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	2.39E-06 (ca)	7.27E-06 (ca)	1.48E-05 (ca)			
4/1/99	2/1/00			1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	2.39E-06 (ca)	7.27E-06 (ca)	1.48E-05 (ca)			
1/31/11	1/31/11			1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	7.98E-05 (ca)	2.42E-04 (ca)	4.95E-04 (ca)			
4/99[4/94]				Polycyclic Aromatic Hydrocarbon (PAH)	1150	1.45E-02 (ca)	4.41E-02 (ca)	9.00E-02 (ca)			
4/99[4/94]				Benz(A)Anthracene	56-55-3	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				Benzo(a)Pyrene	50-32-8	6.28E-04 (ca)	1.91E-03 (ca)	3.89E-03 (ca)			
4/99[4/94]				Benzo(b)Fluoranthene	205-99-2	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				Benzo(j)Fluoranthene	205-82-3	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				Benzo(k)Fluoranthene	207-08-9	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				Chrysene	218-01-9	6.28E-02 (ca)	1.91E-01 (ca)	3.89E-01 (ca)			
4/99[4/94]				Dibenz(a,h)Acridine	226-36-8	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				Dibenz(a,h)Anthracene	53-70-3	1.73E-03 (ca)	5.25E-03 (ca)	1.07E-02 (ca)			
4/99[4/94]				Dibenz(a,j)Acridine	224-42-0	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				Dibenzo(a,e)Pyrene	192-65-4	6.28E-04 (ca)	1.91E-03 (ca)	3.89E-03 (ca)			
4/99[4/94]				Dibenzo(a,h)Pyrene	189-64-0	6.28E-05 (ca)	1.91E-04 (ca)	3.89E-04 (ca)			
4/99[4/94]				Dibenzo(a,i)Pyrene	189-55-9	6.28E-05 (ca)	1.91E-04 (ca)	3.89E-04 (ca)			
4/99[4/94]				Dibenzo(a,l)Pyrene	191-30-0	6.28E-05 (ca)	1.91E-04 (ca)	3.89E-04 (ca)			
4/99[4/94]				7H-Dibenzo(c,g)Carbazole	194-59-2	6.28E-04 (ca)	1.91E-03 (ca)	3.89E-03 (ca)			
4/99[4/94]				7,12-Dimethylbenz(a)Anthracene	57-97-6	2.83E-05 (ca)	8.60E-05 (ca)	1.76E-04 (ca)			
4/99[4/94]				1,6-Dinitropyrene	42397-64-8	6.28E-05 (ca)	1.91E-04 (ca)	3.89E-04 (ca)			
4/99[4/94]				1,8-Dinitropyrene	42397-65-9	6.28E-04 (ca)	1.91E-03 (ca)	3.89E-03 (ca)			
4/99[4/94]				Indeno(1,2,3-c,d)Pyrene	193-39-5	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				3-Methylcholanthrene	56-49-5	3.22E-04 (ca)	9.78E-04 (ca)	2.00E-03 (ca)			
4/99[4/94]				5-Methylchrysene	3697-24-3	6.28E-04 (ca)	1.91E-03 (ca)	3.89E-03 (ca)			
8/4/2004	4/1/00			Naphthalene	91-20-3	4.72E-01 (ca)	1.43E+00 (ca)	2.92E+00 (ca)			
4/99[4/94]				5-Nitroacenaphthene	602-87-9	5.45E-02 (ca)	1.65E-01 (ca)	3.38E-01 (ca)			
4/99[4/94]				6-Nitrochrysene	7496-02-8	6.28E-05 (ca)	1.91E-04 (ca)	3.89E-04 (ca)			
4/99[4/94]				2-Nitrofluorene	607-57-8	6.28E-02 (ca)	1.91E-01 (ca)	3.89E-01 (ca)			
4/99[4/94]				1-Nitropyrene	5522-43-0	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/99[4/94]				4-Nitropyrene	57835-92-4	6.28E-03 (ca)	1.91E-02 (ca)	3.89E-02 (ca)			
4/1/99				1,3-Propane Sultone	1120-71-4	2.36E-02 (ca)	7.16E-02 (ca)	1.46E-01 (ca)			

Table – 1.1 (continued)
Screening Emission Levels

Date Toxicity Criteria Last Updated				Pollutant		Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Cancer	Chronic	8-hr Chronic	Acute	Toxic Air Contaminant	CAS No	Emissions at 25 m (lb/yr)	Emissions at 50 m (lb/yr)	Emissions at 100 m (lb/yr)	Emissions at 25 m, (lb/hr)	Emissions at 50 m, (lb/hr)	Emissions at 100 m, (lb/hr)
	4/1/00			Propylene (Propene)	115-07-1	1.15E+05 (ch)	3.49E+05 (ch)	7.12E+05 (ch)			
	2/1/00			Propylene Glycol Monomethyl Ether	107-98-2	2.68E+05 (ch)	8.14E+05 (ch)	1.66E+06 (ch)			
4/99[7/90]	2/1/00		4/1/99	Propylene Oxide	75-56-9	4.35E+00 (ca)	1.32E+01 (ca)	2.70E+01 (ca)	3.54E+00	9.23E+00	1.38E+01
	12/1/01			Selenium and Compounds	7782-49-2	3.92E+00 (ch)	1.19E+01 (ch)	2.43E+01 (ch)			
			4/1/99	Hydrogen Selenide	7783-07-5				5.71E-03	1.49E-02	2.23E-02
	12/1/01			Selenium Sulfide	7446-34-6	3.92E+00 (ch)	1.19E+01 (ch)	2.43E+01 (ch)			
			4/1/99	Sodium Hydroxide	1310-73-2				9.14E-03	2.38E-02	3.56E-02
	4/1/00		4/1/99	Styrene	100-42-5	3.45E+04 (ch)	1.05E+05 (ch)	2.14E+05 (ch)	2.40E+01	6.25E+01	9.36E+01
	12/1/01		4/1/99	Sulfuric Acid	7664-93-9	3.83E+01 (ch)	1.16E+02 (ch)	2.37E+02 (ch)	1.37E-01	3.57E-01	5.35E-01
	12/1/08		4/1/99	Sulfuric Acid (Sulfur Trioxide)	7446-71-9	3.83E+01 (ch)	1.16E+02 (ch)	2.37E+02 (ch)	1.37E-01	3.57E-01	5.35E-01
			4/1/99	Sulfuric Acid (Oleum)	8014-95-7				1.37E-01	3.57E-01	5.35E-01
4/1/99				1,1,2,2-Tetrachloroethane	79-34-5	2.83E-01 (ca)	8.59E-01 (ca)	1.75E+00 (ca)			
4/1/99				Thioacetamide	62-55-5	9.28E-03 (ca)	2.82E-02 (ca)	5.75E-02 (ca)			
	4/1/00		4/1/99	Toluene	108-88-3	1.15E+04 (ch)	3.49E+04 (ch)	7.12E+04 (ch)	4.23E+01	1.10E+02	1.65E+02
4/1/99	1/1/01			Toluene Diisocyantates	26471-62-5	1.45E+00 (ca)	4.41E+00 (ca)	9.00E+00 (ca)			
4/1/99	1/1/01			Toluene-2,4-Diisocyanate	584-84-9	1.45E+00 (ca)	4.41E+00 (ca)	9.00E+00 (ca)			
4/1/99	1/1/01			Toluene-2,6-Diisocyanate	91-08-7	1.45E+00 (ca)	4.41E+00 (ca)	9.00E+00 (ca)			
4/1/99				1,1,2-Trichloroethane (Vinyl Trichloride)	79-00-5	9.93E-01 (ca)	3.01E+00 (ca)	6.16E+00 (ca)			
10/1/90	4/1/00			Trichloroethylene	79-01-6	8.08E+00 (ca)	2.45E+01 (ca)	5.01E+01 (ca)			
	9/3/02		4/1/99	Triethylamine	121-44-8	7.66E+03 (ch)	2.33E+04 (ch)	4.75E+04 (ch)	3.20E+00	8.34E+00	1.25E+01
4/99[7/90]				Urethane (Ethyl Carbamate)	51-79-6	5.66E-02 (ca)	1.72E-01 (ca)	3.51E-01 (ca)			
			4/1/99	Vanadium (Fume or Dust)	7440-62-2				3.43E-02	8.93E-02	1.34E-01
			4/1/99	Vanadium Pentoxide	1314-62-1				3.43E-02	8.93E-02	1.34E-01
	12/1/01			Vinyl Acetate	108-05-4	7.66E+03 (ch)	2.33E+04 (ch)	4.75E+04 (ch)			
12/1/90			4/1/99	Vinyl Chloride (Chloroethylene)	75-01-4	2.10E-01 (ca)	6.36E-01 (ca)	1.30E+00 (ca)	2.06E+02	5.36E+02	8.02E+02
	1/1/01			Vinylidene Chloride (1,1-Dichloroethylene)	75-35-4	2.68E+03 (ch)	8.14E+03 (ch)	1.66E+04 (ch)			
	4/1/00		4/1/99	Xylenes (Mixed Isomers)	1330-20-7	2.68E+04 (ch)	8.14E+04 (ch)	1.66E+05 (ch)	2.51E+01	6.55E+01	9.80E+01
	4/1/00		4/1/99	m-Xylene	108-38-3	2.68E+04 (ch)	8.14E+04 (ch)	1.66E+05 (ch)	2.51E+01	6.55E+01	9.80E+01
	4/1/00		4/1/99	o-Xylene	95-47-6	2.68E+04 (ch)	8.14E+04 (ch)	1.66E+05 (ch)	2.51E+01	6.55E+01	9.80E+01
	4/1/00		4/1/99	p-Xylene	106-42-3	2.68E+04 (ch)	8.14E+04 (ch)	1.66E+05 (ch)	2.51E+01	6.55E+01	9.80E+01

* ARB removed methyl mercury from the July 3, 2014 Table 1 - Consolidated Table Of OEHHA/ARB Approved Risk Assessment Health Values because it has different chemical properties, potency, and toxicity compared to elemental mercury and mercury salts, and it is not emitted directly from any California facilities.
Note**:** Molecular weight adjustment factors have been applied to values in this table.

Table 2.1
Dispersion Factors (χ/Q)
for Point Source Equipment
Operating 12 Hours per Day or Less

Stack Height ≥ 14 ft to 24 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Stack Ht (ft)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
≥ 14 to 24*	Anaheim	48.05	9.89	5.04	2.90	0.58	0.20	0.06	0.02
≥ 14 to 24*	Azusa	44.21	9.44	4.80	2.75	0.54	0.19	0.06	0.01
≥ 14 to 24*	Banning	39.03	9.60	5.11	3.05	0.71	0.26	0.08	0.02
≥ 14 to 24*	Burbank	33.68	6.88	3.38	1.88	0.35	0.12	0.04	0.01
≥ 14 to 24*	Central LA	37.67	7.94	3.94	2.24	0.44	0.15	0.05	0.01
≥ 14 to 24*	Compton	38.70	8.01	4.03	2.30	0.46	0.15	0.05	0.01
≥ 14 to 24*	Costa Mesa	38.48	8.48	4.23	2.37	0.46	0.16	0.05	0.01
≥ 14 to 24*	Crestline	34.71	7.21	3.56	1.97	0.38	0.13	0.04	0.01
≥ 14 to 24*	Fontana	44.18	10.01	5.22	3.06	0.65	0.23	0.07	0.02
≥ 14 to 24*	Indio	25.10	6.10	3.06	1.73	0.35	0.13	0.04	0.01
≥ 14 to 24*	La Habra	42.02	8.77	4.27	2.37	0.44	0.15	0.05	0.01
≥ 14 to 24*	Lake Elsinore	30.88	7.19	3.62	2.04	0.40	0.14	0.04	0.01
≥ 14 to 24*	LAX	53.29	11.44	6.07	3.64	0.80	0.28	0.09	0.02
≥ 14 to 24*	Long Beach	30.11	6.35	3.18	1.79	0.35	0.12	0.04	0.01
≥ 14 to 24*	Lynwood	43.68	9.11	4.56	2.60	0.51	0.17	0.06	0.01
≥ 14 to 24*	Mission Viejo	32.37	6.95	3.48	1.95	0.37	0.13	0.04	0.01
≥ 14 to 24*	Palm Springs	25.82	5.62	2.73	1.56	0.31	0.11	0.04	0.01
≥ 14 to 24*	Perris	23.01	5.87	3.00	1.74	0.37	0.14	0.04	0.01
≥ 14 to 24*	Pico Rivera	40.67	8.32	4.25	2.43	0.48	0.17	0.06	0.01
≥ 14 to 24*	Pomona	25.80	6.96	3.69	2.12	0.42	0.15	0.05	0.01
≥ 14 to 24*	Redlands	42.39	9.39	4.55	2.49	0.46	0.16	0.05	0.01
≥ 14 to 24*	Reseda	28.17	6.18	2.84	1.49	0.25	0.09	0.03	0.01
≥ 14 to 24*	Riverside	40.92	8.91	4.59	2.66	0.54	0.19	0.06	0.02
≥ 14 to 24*	San Bernardino	35.55	7.97	3.97	2.24	0.45	0.16	0.05	0.01
≥ 14 to 24*	Santa Clarita	30.79	7.13	3.69	2.17	0.46	0.17	0.06	0.01
≥ 14 to 24*	Upland	45.39	9.91	5.09	2.94	0.60	0.21	0.07	0.02
≥ 14 to 24*	West LA	43.75	8.82	4.36	2.42	0.46	0.17	0.06	0.01

*Note: Facilities with stack heights less than 14 feet must perform Tier 3 or 4 dispersion modeling

Table 2.2
Dispersion Factors (χ/Q)
for Point Source Equipment
Operating 12 Hours per Day or Less

Stack Height > 24 ft to 49 ft

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Stack Ht (ft)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
> 24 to 49	Anaheim	29.30	6.78	3.76	2.26	0.50	0.19	0.06	0.02
> 24 to 49	Azusa	24.53	6.55	3.65	2.18	0.47	0.17	0.06	0.01
> 24 to 49	Banning	20.41	6.04	3.66	2.35	0.62	0.24	0.08	0.02
> 24 to 49	Burbank	19.69	4.80	2.58	1.51	0.31	0.12	0.04	0.01
> 24 to 49	Central LA	22.11	5.29	2.91	1.73	0.38	0.14	0.05	0.01
> 24 to 49	Compton	21.37	5.39	2.96	1.76	0.39	0.14	0.05	0.01
> 24 to 49	Costa Mesa	21.18	5.97	3.29	1.93	0.41	0.15	0.05	0.01
> 24 to 49	Crestline	20.22	5.11	2.77	1.61	0.34	0.13	0.04	0.01
> 24 to 49	Fontana	26.01	6.86	3.95	2.43	0.57	0.22	0.07	0.02
> 24 to 49	Indio	14.65	4.37	2.44	1.45	0.32	0.12	0.04	0.01
> 24 to 49	La Habra	24.55	6.18	3.28	1.90	0.39	0.15	0.05	0.01
> 24 to 49	Lake Elsinore	18.89	5.25	2.89	1.69	0.36	0.13	0.04	0.01
> 24 to 49	LAX	31.53	7.71	4.50	2.83	0.69	0.26	0.09	0.02
> 24 to 49	Long Beach	17.32	4.28	2.36	1.39	0.30	0.11	0.04	0.01
> 24 to 49	Lynwood	24.63	6.30	3.43	2.04	0.44	0.16	0.05	0.01
> 24 to 49	Mission Viejo	18.53	4.94	2.74	1.61	0.34	0.13	0.04	0.01
> 24 to 49	Palm Springs	14.67	4.05	2.13	1.25	0.28	0.10	0.03	0.01
> 24 to 49	Perris	13.47	4.17	2.36	1.43	0.34	0.13	0.04	0.01
> 24 to 49	Pico Rivera	23.87	5.76	3.23	1.94	0.43	0.17	0.05	0.01
> 24 to 49	Pomona	14.23	4.69	2.74	1.66	0.37	0.14	0.05	0.01
> 24 to 49	Redlands	23.47	6.69	3.56	2.04	0.42	0.16	0.05	0.01
> 24 to 49	Reseda	16.38	4.49	2.22	1.22	0.23	0.08	0.03	0.01
> 24 to 49	Riverside	22.58	6.17	3.49	2.11	0.47	0.18	0.06	0.01
> 24 to 49	San Bernardino	21.51	5.71	3.10	1.83	0.40	0.15	0.05	0.01
> 24 to 49	Santa Clarita	17.01	4.61	2.67	1.68	0.41	0.16	0.06	0.01
> 24 to 49	Upland	25.17	6.82	3.86	2.33	0.53	0.20	0.07	0.02
> 24 to 49	West LA	25.56	6.18	3.35	1.95	0.42	0.16	0.05	0.01

Table 2.3
Dispersion Factors (χ/Q)
for Point Source Equipment
Operating 12 Hours per Day or Less

Stack Height > 49 ft

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Stack Ht (ft)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
> 49	Anaheim	0.25	0.86	1.16	1.00	0.36	0.17	0.06	0.01
> 49	Azusa	0.39	0.95	1.09	0.93	0.34	0.16	0.05	0.01
> 49	Banning	0.05	0.16	0.51	0.73	0.43	0.21	0.08	0.02
> 49	Burbank	0.39	0.87	0.91	0.73	0.24	0.11	0.04	0.01
> 49	Central LA	0.18	0.72	0.93	0.79	0.28	0.13	0.05	0.01
> 49	Compton	0.44	0.93	0.99	0.79	0.27	0.12	0.05	0.01
> 49	Costa Mesa	0.59	0.98	1.08	0.90	0.31	0.14	0.05	0.01
> 49	Crestline	0.46	0.94	1.00	0.79	0.26	0.12	0.04	0.01
> 49	Fontana	0.21	0.63	0.98	0.99	0.42	0.20	0.07	0.02
> 49	Indio	0.39	0.77	0.84	0.72	0.26	0.12	0.04	0.01
> 49	La Habra	0.80	1.18	1.14	0.89	0.30	0.13	0.05	0.01
> 49	Lake Elsinore	0.38	0.87	0.91	0.76	0.27	0.12	0.04	0.01
> 49	LAX	0.10	0.55	1.02	1.09	0.48	0.23	0.08	0.02
> 49	Long Beach	0.27	0.83	0.86	0.67	0.22	0.10	0.03	0.01
> 49	Lynwood	1.12	1.27	1.18	0.93	0.32	0.15	0.05	0.01
> 49	Mission Viejo	0.23	0.76	0.91	0.78	0.27	0.12	0.04	0.01
> 49	Palm Springs	0.91	1.10	0.94	0.70	0.22	0.10	0.03	0.01
> 49	Perris	0.65	0.83	0.80	0.69	0.27	0.12	0.04	0.01
> 49	Pico Rivera	0.18	0.69	0.93	0.86	0.33	0.15	0.05	0.01
> 49	Pomona	0.66	0.93	0.94	0.78	0.28	0.13	0.05	0.01
> 49	Redlands	0.90	1.29	1.23	0.97	0.32	0.15	0.05	0.01
> 49	Reseda	1.25	1.33	0.96	0.65	0.18	0.08	0.03	0.01
> 49	Riverside	0.46	0.88	1.08	0.94	0.35	0.16	0.06	0.01
> 49	San Bernardino	0.97	1.12	1.08	0.88	0.31	0.14	0.05	0.01
> 49	Santa Clarita	0.38	0.45	0.64	0.69	0.31	0.15	0.06	0.01
> 49	Upland	0.32	0.87	1.16	1.04	0.39	0.18	0.06	0.02
> 49	West LA	0.36	0.91	1.09	0.92	0.33	0.15	0.05	0.01

Table 3.1
Dispersion Factors (χ/Q)
for Point Source Equipment
Operating More Than 12 Hours per Day

Stack Height ≥ 14 ft to 24 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Stack Ht (ft)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
≥ 14 to 24*	Anaheim	49.22	15.26	9.36	6.37	1.81	0.60	0.18	0.05
≥ 14 to 24*	Azusa	50.39	15.35	9.61	6.69	2.01	0.63	0.17	0.05
≥ 14 to 24*	Banning	51.06	15.91	10.06	7.03	2.40	0.96	0.34	0.11
≥ 14 to 24*	Burbank	49.94	15.24	9.21	6.26	1.80	0.56	0.15	0.05
≥ 14 to 24*	Central LA	37.59	12.14	7.40	5.09	1.47	0.45	0.14	0.04
≥ 14 to 24*	Compton	50.39	15.66	10.01	7.03	2.16	0.67	0.18	0.05
≥ 14 to 24*	Costa Mesa	44.29	14.60	9.35	6.42	1.88	0.65	0.21	0.06
≥ 14 to 24*	Crestline	42.84	13.75	8.82	6.17	1.89	0.64	0.19	0.06
≥ 14 to 24*	Fontana	51.74	16.42	10.24	7.11	2.24	0.78	0.24	0.07
≥ 14 to 24*	Indio	48.20	15.85	10.13	7.16	2.34	0.84	0.26	0.08
≥ 14 to 24*	La Habra	47.02	14.44	8.56	5.67	1.67	0.60	0.20	0.06
≥ 14 to 24*	Lake Elsinore	38.60	14.03	8.87	6.21	1.95	0.67	0.20	0.06
≥ 14 to 24*	LAX	52.24	15.71	9.50	6.44	1.93	0.69	0.22	0.06
≥ 14 to 24*	Long Beach	45.54	15.42	9.91	7.07	2.21	0.66	0.16	0.05
≥ 14 to 24*	Lynwood	50.44	15.59	9.82	6.76	2.01	0.67	0.20	0.06
≥ 14 to 24*	Mission Viejo	39.31	12.37	7.92	5.51	1.68	0.58	0.19	0.06
≥ 14 to 24*	Palm Springs	51.14	16.67	10.62	7.44	2.11	0.62	0.16	0.05
≥ 14 to 24*	Perris	41.64	14.37	8.79	6.02	1.88	0.70	0.23	0.07
≥ 14 to 24*	Pico Rivera	45.69	13.52	8.26	5.58	1.58	0.54	0.17	0.05
≥ 14 to 24*	Pomona	50.92	15.96	9.89	6.91	2.09	0.67	0.19	0.06
≥ 14 to 24*	Redlands	51.82	16.13	11.19	8.36	2.76	0.82	0.22	0.07
≥ 14 to 24*	Reseda	41.68	13.81	8.56	5.87	1.74	0.60	0.18	0.06
≥ 14 to 24*	Riverside	47.16	14.61	9.12	6.28	1.90	0.66	0.21	0.06
≥ 14 to 24*	San Bernardino	51.83	17.20	10.51	7.25	2.18	0.73	0.22	0.07
≥ 14 to 24*	Santa Clarita	39.36	12.98	8.53	6.19	1.96	0.60	0.19	0.06
≥ 14 to 24*	Upland	50.91	15.87	10.09	7.36	2.16	0.72	0.21	0.06
≥ 14 to 24*	West LA	46.84	16.73	11.54	8.42	2.56	0.74	0.20	0.06

*Note: Facilities with stack heights less than 14 feet must perform Tier 3 or 4 dispersion modeling

Table 3.2
Dispersion Factors (χ/Q)
for Point Source Equipment
Operating More Than 12 Hours per Day

Stack Height > 24 ft to 49 ft

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Stack Ht (ft)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
> 24 to 49	Anaheim	28.70	9.01	5.91	4.16	1.35	0.54	0.19	0.06
> 24 to 49	Azusa	25.56	8.44	5.69	4.12	1.42	0.54	0.18	0.06
> 24 to 49	Banning	26.52	8.57	5.84	4.31	1.77	0.87	0.36	0.12
> 24 to 49	Burbank	28.70	8.95	5.72	4.02	1.31	0.49	0.16	0.05
> 24 to 49	Central LA	19.13	6.70	4.45	3.19	1.05	0.38	0.14	0.04
> 24 to 49	Compton	27.06	9.24	6.09	4.39	1.50	0.56	0.18	0.05
> 24 to 49	Costa Mesa	26.66	9.74	5.76	3.85	1.25	0.56	0.22	0.07
> 24 to 49	Crestline	27.42	9.34	5.51	3.66	1.18	0.53	0.21	0.07
> 24 to 49	Fontana	28.29	9.20	6.12	4.42	1.64	0.72	0.27	0.09
> 24 to 49	Indio	29.02	9.13	6.03	4.38	1.71	0.79	0.31	0.10
> 24 to 49	La Habra	29.03	9.99	5.81	3.84	1.21	0.54	0.21	0.06
> 24 to 49	Lake Elsinore	20.29	8.15	5.38	3.84	1.38	0.58	0.22	0.07
> 24 to 49	LAX	29.04	9.62	6.19	4.34	1.48	0.63	0.23	0.07
> 24 to 49	Long Beach	20.86	8.21	5.69	4.23	1.52	0.54	0.17	0.05
> 24 to 49	Lynwood	31.63	10.52	6.45	4.44	1.47	0.59	0.21	0.06
> 24 to 49	Mission Viejo	20.90	7.41	5.05	3.61	1.25	0.53	0.20	0.06
> 24 to 49	Palm Springs	30.97	9.31	5.92	4.18	1.40	0.56	0.20	0.06
> 24 to 49	Perris	23.64	9.10	5.65	3.90	1.37	0.63	0.25	0.08
> 24 to 49	Pico Rivera	25.45	7.92	5.23	3.70	1.23	0.51	0.19	0.06
> 24 to 49	Pomona	30.91	10.17	6.23	4.37	1.52	0.59	0.20	0.06
> 24 to 49	Redlands	29.00	10.84	6.36	4.25	1.45	0.62	0.24	0.08
> 24 to 49	Reseda	24.01	8.94	5.25	3.53	1.14	0.48	0.18	0.06
> 24 to 49	Riverside	26.44	9.02	5.80	4.09	1.42	0.61	0.23	0.07
> 24 to 49	San Bernardino	31.81	10.73	6.55	4.53	1.57	0.68	0.26	0.08
> 24 to 49	Santa Clarita	22.26	7.20	4.73	3.39	1.22	0.50	0.20	0.06
> 24 to 49	Upland	26.29	9.28	6.06	4.35	1.58	0.67	0.25	0.08
> 24 to 49	West LA	28.33	9.71	5.68	3.70	1.18	0.51	0.20	0.06

Table 3.3
Dispersion Factors (χ/Q)
for Point Source Equipment
Operating More Than 12 Hours per Day

Stack Height > 49 ft

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Stack Ht (ft)	Location	Downwind Distance (meters)							
		25	50	75	100	200	300	500	1,000
> 49	Anaheim	0.13	0.54	0.86	0.98	0.71	0.43	0.21	0.07
> 49	Azusa	0.20	0.59	0.81	0.89	0.66	0.42	0.21	0.08
> 49	Banning	0.02	0.11	0.30	0.46	0.60	0.50	0.29	0.12
> 49	Burbank	0.18	0.53	0.72	0.86	0.65	0.42	0.21	0.07
> 49	Central LA	0.09	0.33	0.51	0.59	0.45	0.30	0.16	0.06
> 49	Compton	0.22	1.05	1.34	1.33	0.75	0.45	0.22	0.07
> 49	Costa Mesa	0.33	1.68	1.93	1.69	0.83	0.47	0.22	0.07
> 49	Crestline	0.31	1.44	1.68	1.43	0.75	0.44	0.21	0.07
> 49	Fontana	0.12	0.44	0.68	0.83	0.75	0.52	0.27	0.10
> 49	Indio	0.17	0.57	0.69	0.74	0.71	0.54	0.30	0.11
> 49	La Habra	0.44	1.71	1.94	1.66	0.80	0.45	0.21	0.07
> 49	Lake Elsinore	0.21	0.79	0.95	1.02	0.73	0.46	0.23	0.08
> 49	LAX	0.07	0.66	0.91	1.01	0.72	0.46	0.23	0.08
> 49	Long Beach	0.13	0.52	0.79	0.92	0.66	0.41	0.21	0.07
> 49	Lynwood	0.53	1.75	1.91	1.69	0.87	0.51	0.24	0.08
> 49	Mission Viejo	0.12	0.56	0.79	0.91	0.65	0.40	0.20	0.07
> 49	Palm Springs	0.41	0.93	1.15	1.16	0.80	0.50	0.25	0.09
> 49	Perris	0.36	1.29	1.32	1.24	0.76	0.48	0.24	0.08
> 49	Pico Rivera	0.09	0.46	0.66	0.77	0.61	0.39	0.20	0.07
> 49	Pomona	0.54	1.90	2.02	1.74	0.90	0.53	0.25	0.09
> 49	Redlands	0.51	1.60	1.88	1.80	0.97	0.58	0.28	0.10
> 49	Reseda	0.62	1.92	1.93	1.60	0.72	0.40	0.18	0.06
> 49	Riverside	0.27	1.02	1.25	1.25	0.79	0.48	0.23	0.08
> 49	San Bernardino	0.52	1.38	1.49	1.39	0.88	0.56	0.28	0.10
> 49	Santa Clarita	0.23	0.73	0.84	0.87	0.63	0.40	0.20	0.07
> 49	Upland	0.19	0.64	0.92	1.05	0.87	0.57	0.30	0.11
> 49	West LA	0.22	1.50	1.75	1.56	0.75	0.42	0.19	0.06

Table 4.1
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating 12 Hours per Day or Less

Building Area ≤ 3,000 ft^2, Height ≤ 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
≤ 3,000	≤ 20	Anaheim	8.62	3.03	1.74	1.13	0.36	0.17	0.06	0.02
≤ 3,000	≤ 20	Azusa	10.08	3.50	1.85	1.15	0.34	0.16	0.06	0.01
≤ 3,000	≤ 20	Banning	15.42	5.59	2.88	1.76	0.50	0.23	0.08	0.02
≤ 3,000	≤ 20	Burbank	8.31	2.55	1.34	0.83	0.24	0.11	0.04	0.01
≤ 3,000	≤ 20	Central LA	7.61	2.36	1.33	0.86	0.27	0.13	0.05	0.01
≤ 3,000	≤ 20	Compton	8.11	2.45	1.31	0.83	0.26	0.13	0.05	0.01
≤ 3,000	≤ 20	Costa Mesa	10.20	3.43	1.78	1.09	0.31	0.14	0.05	0.01
≤ 3,000	≤ 20	Crestline	9.45	2.96	1.49	0.90	0.25	0.12	0.04	0.01
≤ 3,000	≤ 20	Fontana	13.28	4.84	2.53	1.56	0.44	0.20	0.07	0.02
≤ 3,000	≤ 20	Indio	10.78	3.48	1.69	0.99	0.26	0.11	0.04	0.01
≤ 3,000	≤ 20	La Habra	9.50	2.92	1.53	0.96	0.28	0.13	0.05	0.01
≤ 3,000	≤ 20	Lake Elsinore	11.33	3.60	1.75	1.03	0.27	0.12	0.04	0.01
≤ 3,000	≤ 20	LAX	13.61	5.21	2.81	1.76	0.52	0.24	0.09	0.02
≤ 3,000	≤ 20	Long Beach	8.37	2.57	1.28	0.77	0.22	0.10	0.04	0.01
≤ 3,000	≤ 20	Lynwood	9.67	3.13	1.64	1.03	0.31	0.15	0.06	0.01
≤ 3,000	≤ 20	Mission Viejo	10.69	3.50	1.74	1.03	0.27	0.12	0.04	0.01
≤ 3,000	≤ 20	Palm Springs	9.11	2.73	1.32	0.78	0.21	0.09	0.03	0.01
≤ 3,000	≤ 20	Perris	12.21	3.88	1.86	1.09	0.28	0.12	0.04	0.01
≤ 3,000	≤ 20	Pico Rivera	10.18	3.60	1.90	1.18	0.34	0.15	0.05	0.01
≤ 3,000	≤ 20	Pomona	9.36	2.91	1.53	0.95	0.28	0.13	0.05	0.01
≤ 3,000	≤ 20	Redlands	11.12	3.60	1.82	1.11	0.31	0.14	0.05	0.01
≤ 3,000	≤ 20	Reseda	9.54	2.70	1.23	0.70	0.17	0.08	0.03	0.01
≤ 3,000	≤ 20	Riverside	10.76	3.77	1.97	1.22	0.35	0.16	0.06	0.02
≤ 3,000	≤ 20	San Bernardino	10.84	3.60	1.83	1.11	0.31	0.14	0.05	0.01
≤ 3,000	≤ 20	Santa Clarita	10.97	3.64	1.85	1.13	0.33	0.16	0.06	0.01
≤ 3,000	≤ 20	Upland	10.95	3.99	2.14	1.34	0.39	0.18	0.07	0.02
≤ 3,000	≤ 20	West LA	9.02	3.14	1.70	1.08	0.32	0.15	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.2
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating 12 Hours per Day or Less

Building Area > 3,000 to 10,000 ft^2, Height ≤ 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 3,000 to 10,000	≤ 20	Anaheim	6.49	2.68	1.59	1.05	0.34	0.17	0.06	0.02
> 3,000 to 10,000	≤ 20	Azusa	7.74	3.04	1.67	1.07	0.33	0.15	0.06	0.01
> 3,000 to 10,000	≤ 20	Banning	11.98	4.81	2.59	1.62	0.48	0.22	0.08	0.02
> 3,000 to 10,000	≤ 20	Burbank	6.24	2.22	1.22	0.77	0.23	0.10	0.04	0.01
> 3,000 to 10,000	≤ 20	Central LA	5.73	2.07	1.21	0.80	0.26	0.12	0.05	0.01
> 3,000 to 10,000	≤ 20	Compton	6.08	2.13	1.19	0.77	0.25	0.12	0.05	0.01
> 3,000 to 10,000	≤ 20	Costa Mesa	7.78	2.98	1.61	1.01	0.29	0.13	0.05	0.01
> 3,000 to 10,000	≤ 20	Crestline	7.10	2.55	1.34	0.83	0.24	0.11	0.04	0.01
> 3,000 to 10,000	≤ 20	Fontana	10.36	4.19	2.28	1.44	0.42	0.20	0.07	0.02
> 3,000 to 10,000	≤ 20	Indio	8.24	2.97	1.51	0.91	0.25	0.11	0.04	0.01
> 3,000 to 10,000	≤ 20	La Habra	7.09	2.53	1.38	0.89	0.27	0.13	0.05	0.01
> 3,000 to 10,000	≤ 20	Lake Elsinore	8.63	3.08	1.57	0.95	0.26	0.12	0.04	0.01
> 3,000 to 10,000	≤ 20	LAX	10.70	4.54	2.54	1.63	0.50	0.24	0.09	0.02
> 3,000 to 10,000	≤ 20	Long Beach	6.29	2.21	1.15	0.71	0.21	0.10	0.04	0.01
> 3,000 to 10,000	≤ 20	Lynwood	7.24	2.72	1.49	0.95	0.30	0.14	0.05	0.01
> 3,000 to 10,000	≤ 20	Mission Viejo	8.19	3.01	1.56	0.95	0.26	0.12	0.04	0.01
> 3,000 to 10,000	≤ 20	Palm Springs	6.78	2.33	1.19	0.71	0.20	0.09	0.03	0.01
> 3,000 to 10,000	≤ 20	Perris	9.30	3.30	1.66	0.99	0.27	0.12	0.04	0.01
> 3,000 to 10,000	≤ 20	Pico Rivera	7.90	3.14	1.72	1.09	0.32	0.15	0.05	0.01
> 3,000 to 10,000	≤ 20	Pomona	6.98	2.53	1.38	0.88	0.27	0.13	0.05	0.01
> 3,000 to 10,000	≤ 20	Redlands	8.44	3.10	1.64	1.02	0.30	0.14	0.05	0.01
> 3,000 to 10,000	≤ 20	Reseda	7.08	2.28	1.09	0.64	0.17	0.07	0.03	0.01
> 3,000 to 10,000	≤ 20	Riverside	8.32	3.27	1.78	1.13	0.34	0.16	0.06	0.02
> 3,000 to 10,000	≤ 20	San Bernardino	8.28	3.11	1.65	1.02	0.29	0.14	0.05	0.01
> 3,000 to 10,000	≤ 20	Santa Clarita	8.36	3.12	1.66	1.04	0.32	0.15	0.06	0.01
> 3,000 to 10,000	≤ 20	Upland	8.51	3.48	1.94	1.24	0.38	0.18	0.06	0.02
> 3,000 to 10,000	≤ 20	West LA	6.86	2.75	1.55	1.00	0.31	0.15	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.3
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating 12 Hours per Day or Less

Building Area > 3,000 to 10,000 ft^2, Height > 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 3,000 to 10,000	> 20	Anaheim	6.89	2.99	1.69	1.09	0.34	0.16	0.06	0.02
> 3,000 to 10,000	> 20	Azusa	7.69	3.16	1.72	1.08	0.32	0.15	0.05	0.01
> 3,000 to 10,000	> 20	Banning	9.27	4.39	2.48	1.57	0.47	0.22	0.08	0.02
> 3,000 to 10,000	> 20	Burbank	6.04	2.38	1.28	0.80	0.23	0.10	0.04	0.01
> 3,000 to 10,000	> 20	Central LA	5.84	2.42	1.34	0.86	0.26	0.12	0.05	0.01
> 3,000 to 10,000	> 20	Compton	5.97	2.35	1.28	0.81	0.25	0.12	0.05	0.01
> 3,000 to 10,000	> 20	Costa Mesa	7.58	3.06	1.65	1.02	0.29	0.13	0.05	0.01
> 3,000 to 10,000	> 20	Crestline	6.87	2.65	1.39	0.86	0.24	0.11	0.04	0.01
> 3,000 to 10,000	> 20	Fontana	9.46	4.15	2.28	1.43	0.42	0.19	0.07	0.02
> 3,000 to 10,000	> 20	Indio	7.32	2.89	1.50	0.91	0.24	0.11	0.04	0.01
> 3,000 to 10,000	> 20	La Habra	6.96	2.70	1.46	0.92	0.27	0.13	0.05	0.01
> 3,000 to 10,000	> 20	Lake Elsinore	7.74	3.01	1.56	0.95	0.26	0.12	0.04	0.01
> 3,000 to 10,000	> 20	LAX	9.87	4.50	2.53	1.61	0.49	0.23	0.08	0.02
> 3,000 to 10,000	> 20	Long Beach	6.00	2.28	1.18	0.72	0.21	0.09	0.03	0.01
> 3,000 to 10,000	> 20	Lynwood	7.36	2.89	1.56	0.98	0.29	0.14	0.05	0.01
> 3,000 to 10,000	> 20	Mission Viejo	7.52	2.99	1.57	0.95	0.26	0.12	0.04	0.01
> 3,000 to 10,000	> 20	Palm Springs	6.67	2.42	1.22	0.73	0.20	0.09	0.03	0.01
> 3,000 to 10,000	> 20	Perris	8.00	3.15	1.63	0.98	0.26	0.12	0.04	0.01
> 3,000 to 10,000	> 20	Pico Rivera	7.69	3.24	1.77	1.11	0.32	0.15	0.05	0.01
> 3,000 to 10,000	> 20	Pomona	6.97	2.72	1.46	0.91	0.27	0.12	0.04	0.01
> 3,000 to 10,000	> 20	Redlands	8.24	3.19	1.68	1.04	0.30	0.14	0.05	0.01
> 3,000 to 10,000	> 20	Reseda	6.75	2.30	1.11	0.65	0.17	0.07	0.03	0.01
> 3,000 to 10,000	> 20	Riverside	8.07	3.33	1.81	1.13	0.33	0.15	0.06	0.01
> 3,000 to 10,000	> 20	San Bernardino	8.03	3.17	1.68	1.03	0.29	0.13	0.05	0.01
> 3,000 to 10,000	> 20	Santa Clarita	7.25	3.08	1.67	1.05	0.31	0.15	0.06	0.01
> 3,000 to 10,000	> 20	Upland	8.55	3.63	1.99	1.26	0.37	0.17	0.06	0.02
> 3,000 to 10,000	> 20	West LA	7.03	2.93	1.62	1.03	0.31	0.14	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.4
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating 12 Hours per Day or Less

Building Area > 10,000 to 30,000 ft2, Height ≤ 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 10,000 to 30,000	≤ 20	Anaheim	4.46	2.23	1.38	0.94	0.32	0.16	0.06	0.02
> 10,000 to 30,000	≤ 20	Azusa	5.38	2.45	1.43	0.94	0.30	0.15	0.05	0.01
> 10,000 to 30,000	≤ 20	Banning	8.23	3.80	2.18	1.42	0.44	0.21	0.08	0.02
> 10,000 to 30,000	≤ 20	Burbank	4.13	1.80	1.04	0.68	0.21	0.10	0.04	0.01
> 10,000 to 30,000	≤ 20	Central LA	3.81	1.72	1.05	0.71	0.24	0.12	0.05	0.01
> 10,000 to 30,000	≤ 20	Compton	4.02	1.73	1.03	0.69	0.23	0.12	0.05	0.01
> 10,000 to 30,000	≤ 20	Costa Mesa	5.37	2.39	1.37	0.89	0.27	0.13	0.05	0.01
> 10,000 to 30,000	≤ 20	Crestline	4.77	2.03	1.14	0.73	0.23	0.11	0.04	0.01
> 10,000 to 30,000	≤ 20	Fontana	7.27	3.36	1.94	1.26	0.39	0.19	0.07	0.02
> 10,000 to 30,000	≤ 20	Indio	5.58	2.33	1.27	0.79	0.23	0.11	0.04	0.01
> 10,000 to 30,000	≤ 20	La Habra	4.70	2.03	1.19	0.78	0.25	0.12	0.04	0.01
> 10,000 to 30,000	≤ 20	Lake Elsinore	5.84	2.42	1.31	0.82	0.24	0.11	0.04	0.01
> 10,000 to 30,000	≤ 20	LAX	7.59	3.66	2.17	1.43	0.47	0.23	0.08	0.02
> 10,000 to 30,000	≤ 20	Long Beach	4.17	1.76	0.97	0.62	0.19	0.09	0.03	0.01
> 10,000 to 30,000	≤ 20	Lynwood	4.91	2.19	1.27	0.84	0.28	0.14	0.05	0.01
> 10,000 to 30,000	≤ 20	Mission Viejo	5.61	2.38	1.31	0.83	0.24	0.11	0.04	0.01
> 10,000 to 30,000	≤ 20	Palm Springs	4.48	1.83	1.00	0.62	0.18	0.09	0.03	0.01
> 10,000 to 30,000	≤ 20	Perris	6.27	2.58	1.39	0.86	0.25	0.11	0.04	0.01
> 10,000 to 30,000	≤ 20	Pico Rivera	5.54	2.53	1.47	0.96	0.30	0.14	0.05	0.01
> 10,000 to 30,000	≤ 20	Pomona	4.63	2.04	1.18	0.78	0.25	0.12	0.04	0.01
> 10,000 to 30,000	≤ 20	Redlands	5.73	2.47	1.39	0.90	0.28	0.13	0.05	0.01
> 10,000 to 30,000	≤ 20	Reseda	4.61	1.75	0.91	0.55	0.15	0.07	0.03	0.01
> 10,000 to 30,000	≤ 20	Riverside	5.80	2.63	1.52	0.99	0.32	0.15	0.06	0.02
> 10,000 to 30,000	≤ 20	San Bernardino	5.68	2.48	1.40	0.90	0.27	0.13	0.05	0.01
> 10,000 to 30,000	≤ 20	Santa Clarita	5.65	2.46	1.41	0.92	0.30	0.14	0.06	0.01
> 10,000 to 30,000	≤ 20	Upland	6.01	2.82	1.66	1.09	0.35	0.17	0.06	0.02
> 10,000 to 30,000	≤ 20	West LA	4.78	2.24	1.33	0.89	0.29	0.14	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.5
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating 12 Hours per Day or Less

Building Area > 10,000 to 30,000ft2, Height > 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 10,000 to 30,000	>20	Anaheim	5.02	2.44	1.45	0.96	0.32	0.15	0.06	0.01
> 10,000 to 30,000	>20	Azusa	5.50	2.54	1.47	0.95	0.30	0.14	0.05	0.01
> 10,000 to 30,000	>20	Banning	6.85	3.54	2.10	1.37	0.43	0.21	0.08	0.02
> 10,000 to 30,000	>20	Burbank	4.28	1.91	1.09	0.70	0.21	0.10	0.04	0.01
> 10,000 to 30,000	>20	Central LA	4.19	1.96	1.15	0.76	0.24	0.12	0.04	0.01
> 10,000 to 30,000	>20	Compton	4.21	1.89	1.09	0.71	0.23	0.11	0.04	0.01
> 10,000 to 30,000	>20	Costa Mesa	5.42	2.46	1.40	0.90	0.27	0.12	0.05	0.01
> 10,000 to 30,000	>20	Crestline	4.83	2.11	1.18	0.75	0.23	0.11	0.04	0.01
> 10,000 to 30,000	>20	Fontana	6.91	3.34	1.93	1.25	0.39	0.18	0.07	0.02
> 10,000 to 30,000	>20	Indio	5.18	2.28	1.26	0.79	0.23	0.10	0.04	0.01
> 10,000 to 30,000	>20	La Habra	4.87	2.17	1.24	0.81	0.25	0.12	0.04	0.01
> 10,000 to 30,000	>20	Lake Elsinore	5.46	2.38	1.31	0.82	0.24	0.11	0.04	0.01
> 10,000 to 30,000	>20	LAX	7.27	3.64	2.15	1.41	0.45	0.22	0.08	0.02
> 10,000 to 30,000	>20	Long Beach	4.19	1.81	1.00	0.63	0.19	0.09	0.03	0.01
> 10,000 to 30,000	>20	Lynwood	5.16	2.32	1.33	0.86	0.27	0.13	0.05	0.01
> 10,000 to 30,000	>20	Mission Viejo	5.37	2.38	1.32	0.83	0.24	0.11	0.04	0.01
> 10,000 to 30,000	>20	Palm Springs	4.57	1.90	1.02	0.63	0.18	0.09	0.03	0.01
> 10,000 to 30,000	>20	Perris	5.65	2.49	1.37	0.85	0.25	0.11	0.04	0.01
> 10,000 to 30,000	>20	Pico Rivera	5.59	2.62	1.51	0.97	0.30	0.14	0.05	0.01
> 10,000 to 30,000	>20	Pomona	4.89	2.18	1.24	0.80	0.25	0.12	0.04	0.01
> 10,000 to 30,000	>20	Redlands	5.77	2.54	1.42	0.91	0.28	0.13	0.05	0.01
> 10,000 to 30,000	>20	Reseda	4.53	1.78	0.92	0.56	0.15	0.07	0.03	0.01
> 10,000 to 30,000	>20	Riverside	5.78	2.67	1.53	0.99	0.31	0.15	0.05	0.01
> 10,000 to 30,000	>20	San Bernardino	5.66	2.52	1.42	0.90	0.27	0.13	0.05	0.01
> 10,000 to 30,000	>20	Santa Clarita	5.19	2.45	1.41	0.92	0.29	0.14	0.05	0.01
> 10,000 to 30,000	>20	Upland	6.19	2.92	1.70	1.10	0.34	0.16	0.06	0.02
> 10,000 to 30,000	>20	West LA	5.06	2.37	1.38	0.91	0.29	0.14	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 4.6
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating 12 Hours per Day or Less

Building Area > 30,000 ft^2, Height > 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 30,000	>20	Anaheim	3.21	1.78	1.14	0.79	0.28	0.14	0.05	0.01
> 30,000	>20	Azusa	3.42	1.83	1.13	0.77	0.26	0.13	0.05	0.01
> 30,000	>20	Banning	4.36	2.52	1.61	1.11	0.38	0.19	0.07	0.02
> 30,000	>20	Burbank	2.66	1.38	0.85	0.57	0.19	0.09	0.03	0.01
> 30,000	>20	Central LA	2.64	1.43	0.90	0.62	0.22	0.11	0.04	0.01
> 30,000	>20	Compton	2.60	1.37	0.85	0.58	0.21	0.10	0.04	0.01
> 30,000	>20	Costa Mesa	3.38	1.77	1.08	0.73	0.24	0.11	0.04	0.01
> 30,000	>20	Crestline	2.95	1.51	0.91	0.61	0.20	0.10	0.04	0.01
> 30,000	>20	Fontana	4.35	2.38	1.49	1.01	0.34	0.17	0.06	0.02
> 30,000	>20	Indio	3.14	1.60	0.95	0.63	0.20	0.09	0.03	0.01
> 30,000	>20	La Habra	2.98	1.56	0.97	0.66	0.22	0.11	0.04	0.01
> 30,000	>20	Lake Elsinore	3.32	1.67	1.00	0.66	0.21	0.10	0.04	0.01
> 30,000	>20	LAX	4.62	2.61	1.66	1.14	0.40	0.20	0.08	0.02
> 30,000	>20	Long Beach	2.55	1.28	0.76	0.51	0.17	0.08	0.03	0.01
> 30,000	>20	Lynwood	3.16	1.66	1.03	0.70	0.24	0.12	0.05	0.01
> 30,000	>20	Mission Viejo	3.31	1.69	1.01	0.67	0.21	0.10	0.04	0.01
> 30,000	>20	Palm Springs	2.69	1.32	0.77	0.51	0.16	0.08	0.03	0.01
> 30,000	>20	Perris	3.43	1.74	1.04	0.68	0.22	0.10	0.04	0.01
> 30,000	>20	Pico Rivera	3.53	1.89	1.17	0.79	0.26	0.13	0.05	0.01
> 30,000	>20	Pomona	2.99	1.56	0.97	0.66	0.22	0.11	0.04	0.01
> 30,000	>20	Redlands	3.50	1.80	1.09	0.73	0.24	0.12	0.05	0.01
> 30,000	>20	Reseda	2.58	1.21	0.69	0.44	0.13	0.06	0.02	0.01
> 30,000	>20	Riverside	3.58	1.90	1.18	0.80	0.27	0.13	0.05	0.01
> 30,000	>20	San Bernardino	3.46	1.79	1.09	0.73	0.24	0.12	0.04	0.01
> 30,000	>20	Santa Clarita	3.19	1.73	1.08	0.74	0.26	0.13	0.05	0.01
> 30,000	>20	Upland	3.89	2.10	1.31	0.89	0.31	0.15	0.06	0.01
> 30,000	>20	West LA	3.18	1.72	1.08	0.74	0.25	0.12	0.05	0.01

*Note: Facilities with building dimensions outside the ranges in Tables 4 must perform Tier 3 or 4 dispersion modeling

Table 5.1
Dispersion Factors (χ/Q) for Volume Source Equipment Operating More Than 12 Hours per Day

Building Area ≤ 3,000 ft², Height ≤ 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft²)	Ht (ft)		25	50	75	100	200	300	500	1,000
≤ 3,000	≤ 20	Anaheim	20.33	7.40	3.98	2.53	0.81	0.41	0.17	0.05
≤ 3,000	≤ 20	Azusa	19.40	7.11	3.79	2.40	0.76	0.39	0.16	0.05
≤ 3,000	≤ 20	Banning	29.64	12.42	6.96	4.51	1.52	0.79	0.34	0.11
≤ 3,000	≤ 20	Burbank	19.10	6.77	3.58	2.25	0.72	0.36	0.15	0.05
≤ 3,000	≤ 20	Central LA	16.03	5.71	3.07	1.95	0.63	0.32	0.13	0.04
≤ 3,000	≤ 20	Compton	21.02	7.40	3.93	2.49	0.80	0.41	0.17	0.05
≤ 3,000	≤ 20	Costa Mesa	25.65	9.20	4.86	3.05	0.96	0.48	0.20	0.06
≤ 3,000	≤ 20	Crestline	23.49	8.37	4.40	2.76	0.88	0.44	0.19	0.06
≤ 3,000	≤ 20	Fontana	24.92	9.60	5.21	3.33	1.09	0.56	0.24	0.07
≤ 3,000	≤ 20	Indio	26.75	10.36	5.62	3.59	1.19	0.61	0.27	0.09
≤ 3,000	≤ 20	La Habra	24.67	8.71	4.61	2.90	0.92	0.47	0.20	0.06
≤ 3,000	≤ 20	Lake Elsinore	24.71	8.94	4.71	2.95	0.94	0.47	0.20	0.06
≤ 3,000	≤ 20	LAX	24.26	9.16	4.93	3.13	1.00	0.51	0.21	0.07
≤ 3,000	≤ 20	Long Beach	19.36	6.87	3.63	2.28	0.73	0.37	0.16	0.05
≤ 3,000	≤ 20	Lynwood	23.89	8.50	4.50	2.84	0.91	0.46	0.19	0.06
≤ 3,000	≤ 20	Mission Viejo	23.44	8.45	4.44	2.77	0.87	0.44	0.18	0.06
≤ 3,000	≤ 20	Palm Springs	19.46	6.87	3.60	2.25	0.71	0.36	0.15	0.05
≤ 3,000	≤ 20	Perris	27.48	10.06	5.33	3.35	1.07	0.54	0.23	0.07
≤ 3,000	≤ 20	Pico Rivera	19.93	7.33	3.90	2.46	0.78	0.39	0.16	0.05
≤ 3,000	≤ 20	Pomona	23.75	8.40	4.45	2.80	0.89	0.45	0.19	0.06
≤ 3,000	≤ 20	Redlands	26.76	9.60	5.07	3.19	1.01	0.51	0.22	0.07
≤ 3,000	≤ 20	Reseda	23.86	8.27	4.28	2.66	0.84	0.42	0.18	0.06
≤ 3,000	≤ 20	Riverside	23.99	8.80	4.68	2.96	0.94	0.48	0.20	0.06
≤ 3,000	≤ 20	San Bernardino	25.53	9.31	4.96	3.13	1.00	0.51	0.22	0.07
≤ 3,000	≤ 20	Santa Clarita	21.89	8.02	4.26	2.69	0.86	0.44	0.19	0.06
≤ 3,000	≤ 20	Upland	24.01	8.91	4.78	3.03	0.98	0.49	0.21	0.06
≤ 3,000	≤ 20	West LA	23.97	8.63	4.59	2.89	0.92	0.46	0.19	0.06

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.2
Dispersion Factors (χ/Q) for Volume Source Equipment Operating More Than 12 Hours per Day

Building Area > 3,000 to 10,000 ft^2, Height ≤ 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 3,000 to 10,000	≤ 20	Anaheim	15.93	6.47	3.62	2.35	0.78	0.40	0.17	0.05
> 3,000 to 10,000	≤ 20	Azusa	15.27	6.20	3.45	2.23	0.74	0.38	0.16	0.05
> 3,000 to 10,000	≤ 20	Banning	23.82	10.88	6.33	4.20	1.47	0.77	0.34	0.11
> 3,000 to 10,000	≤ 20	Burbank	14.93	5.90	3.26	2.09	0.69	0.35	0.15	0.05
> 3,000 to 10,000	≤ 20	Central LA	12.56	4.99	2.79	1.81	0.60	0.31	0.13	0.04
> 3,000 to 10,000	≤ 20	Compton	16.40	6.44	3.57	2.31	0.77	0.40	0.17	0.05
> 3,000 to 10,000	≤ 20	Costa Mesa	20.09	8.01	4.41	2.83	0.93	0.47	0.20	0.06
> 3,000 to 10,000	≤ 20	Crestline	18.39	7.28	4.00	2.56	0.84	0.43	0.18	0.06
> 3,000 to 10,000	≤ 20	Fontana	19.79	8.39	4.74	3.09	1.04	0.54	0.23	0.07
> 3,000 to 10,000	≤ 20	Indio	21.26	9.04	5.11	3.34	1.14	0.60	0.26	0.09
> 3,000 to 10,000	≤ 20	La Habra	19.24	7.58	4.18	2.69	0.89	0.45	0.19	0.06
> 3,000 to 10,000	≤ 20	Lake Elsinore	19.43	7.78	4.27	2.74	0.90	0.46	0.20	0.06
> 3,000 to 10,000	≤ 20	LAX	19.22	8.00	4.48	2.90	0.97	0.49	0.21	0.06
> 3,000 to 10,000	≤ 20	Long Beach	15.14	5.98	3.29	2.12	0.70	0.36	0.15	0.05
> 3,000 to 10,000	≤ 20	Lynwood	18.64	7.40	4.09	2.64	0.88	0.45	0.19	0.06
> 3,000 to 10,000	≤ 20	Mission Viejo	18.44	7.35	4.02	2.57	0.84	0.43	0.18	0.06
> 3,000 to 10,000	≤ 20	Palm Springs	15.19	5.97	3.26	2.09	0.68	0.35	0.15	0.05
> 3,000 to 10,000	≤ 20	Perris	21.65	8.76	4.83	3.11	1.03	0.53	0.23	0.07
> 3,000 to 10,000	≤ 20	Pico Rivera	15.73	6.40	3.55	2.28	0.75	0.38	0.16	0.05
> 3,000 to 10,000	≤ 20	Pomona	18.51	7.31	4.04	2.60	0.86	0.44	0.19	0.06
> 3,000 to 10,000	≤ 20	Redlands	20.96	8.35	4.60	2.96	0.97	0.50	0.21	0.07
> 3,000 to 10,000	≤ 20	Reseda	18.57	7.17	3.88	2.47	0.80	0.41	0.18	0.06
> 3,000 to 10,000	≤ 20	Riverside	18.90	7.67	4.25	2.74	0.91	0.47	0.20	0.06
> 3,000 to 10,000	≤ 20	San Bernardino	20.07	8.12	4.50	2.90	0.96	0.50	0.21	0.07
> 3,000 to 10,000	≤ 20	Santa Clarita	17.24	6.98	3.87	2.50	0.83	0.43	0.18	0.06
> 3,000 to 10,000	≤ 20	Upland	18.94	7.78	4.35	2.82	0.94	0.48	0.21	0.06
> 3,000 to 10,000	≤ 20	West LA	18.76	7.52	4.17	2.69	0.89	0.45	0.19	0.06

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.3
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating More Than 12 Hours per Day

Building Area > 3,000 to 10,000 ft^2, Height > 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 3,000 to 10,000	>20	Anaheim	14.07	6.16	3.51	2.30	0.77	0.40	0.17	0.05
> 3,000 to 10,000	>20	Azusa	13.11	5.77	3.29	2.15	0.72	0.37	0.16	0.05
> 3,000 to 10,000	>20	Banning	15.44	8.15	5.09	3.51	1.31	0.71	0.32	0.10
> 3,000 to 10,000	>20	Burbank	13.10	5.59	3.15	2.05	0.68	0.35	0.15	0.05
> 3,000 to 10,000	>20	Central LA	10.92	4.78	2.73	1.78	0.60	0.31	0.13	0.04
> 3,000 to 10,000	>20	Compton	14.74	6.23	3.51	2.28	0.77	0.39	0.17	0.05
> 3,000 to 10,000	>20	Costa Mesa	17.74	7.57	4.26	2.76	0.92	0.47	0.20	0.06
> 3,000 to 10,000	>20	Crestline	16.00	6.82	3.84	2.49	0.83	0.43	0.18	0.06
> 3,000 to 10,000	>20	Fontana	15.41	7.24	4.26	2.83	0.98	0.52	0.22	0.07
> 3,000 to 10,000	>20	Indio	15.55	7.40	4.40	2.96	1.06	0.56	0.25	0.08
> 3,000 to 10,000	>20	La Habra	17.22	7.27	4.08	2.65	0.88	0.45	0.19	0.06
> 3,000 to 10,000	>20	Lake Elsinore	16.09	7.06	4.01	2.61	0.88	0.45	0.19	0.06
> 3,000 to 10,000	>20	LAX	15.78	7.21	4.17	2.75	0.93	0.48	0.20	0.06
> 3,000 to 10,000	>20	Long Beach	13.29	5.67	3.19	2.07	0.69	0.35	0.15	0.05
> 3,000 to 10,000	>20	Lynwood	16.84	7.12	4.00	2.59	0.87	0.44	0.19	0.06
> 3,000 to 10,000	>20	Mission Viejo	15.58	6.77	3.82	2.48	0.82	0.42	0.18	0.06
> 3,000 to 10,000	>20	Palm Springs	13.13	5.58	3.13	2.02	0.67	0.35	0.15	0.05
> 3,000 to 10,000	>20	Perris	17.55	7.79	4.46	2.92	0.99	0.51	0.22	0.07
> 3,000 to 10,000	>20	Pico Rivera	13.22	5.88	3.36	2.20	0.73	0.38	0.16	0.05
> 3,000 to 10,000	>20	Pomona	16.74	7.05	3.95	2.56	0.85	0.44	0.19	0.06
> 3,000 to 10,000	>20	Redlands	18.51	7.89	4.44	2.88	0.96	0.49	0.21	0.07
> 3,000 to 10,000	>20	Reseda	16.65	6.82	3.76	2.42	0.80	0.41	0.18	0.06
> 3,000 to 10,000	>20	Riverside	16.20	7.10	4.04	2.64	0.89	0.46	0.20	0.06
> 3,000 to 10,000	>20	San Bernardino	17.04	7.44	4.24	2.77	0.94	0.48	0.21	0.07
> 3,000 to 10,000	>20	Santa Clarita	14.00	6.28	3.61	2.37	0.80	0.42	0.18	0.06
> 3,000 to 10,000	>20	Upland	16.17	7.19	4.12	2.70	0.91	0.47	0.20	0.06
> 3,000 to 10,000	>20	West LA	16.89	7.21	4.06	2.64	0.88	0.45	0.19	0.06

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.4
Dispersion Factors (χ/Q) for Volume Source Equipment Operating More Than 12 Hours per Day

Building Area > 10,000 to 30,000 ft^2, Height ≤ 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 10,000 to 30,000	≤ 20	Anaheim	11.28	5.27	3.12	2.09	0.73	0.38	0.17	0.05
> 10,000 to 30,000	≤ 20	Azusa	10.85	5.03	2.96	1.98	0.69	0.36	0.15	0.05
> 10,000 to 30,000	≤ 20	Banning	17.16	8.82	5.44	3.72	1.38	0.74	0.33	0.11
> 10,000 to 30,000	≤ 20	Burbank	10.49	4.78	2.80	1.86	0.65	0.34	0.15	0.05
> 10,000 to 30,000	≤ 20	Central LA	8.84	4.06	2.41	1.61	0.57	0.30	0.13	0.04
> 10,000 to 30,000	≤ 20	Compton	11.50	5.23	3.08	2.06	0.73	0.38	0.17	0.05
> 10,000 to 30,000	≤ 20	Costa Mesa	14.20	6.48	3.78	2.51	0.87	0.45	0.20	0.06
> 10,000 to 30,000	≤ 20	Crestline	12.96	5.88	3.43	2.28	0.79	0.41	0.18	0.06
> 10,000 to 30,000	≤ 20	Fontana	14.15	6.80	4.07	2.74	0.98	0.52	0.23	0.07
> 10,000 to 30,000	≤ 20	Indio	15.18	7.32	4.39	2.97	1.07	0.57	0.26	0.08
> 10,000 to 30,000	≤ 20	La Habra	13.51	6.14	3.59	2.39	0.83	0.43	0.19	0.06
> 10,000 to 30,000	≤ 20	Lake Elsinore	13.76	6.28	3.66	2.43	0.84	0.44	0.19	0.06
> 10,000 to 30,000	≤ 20	LAX	13.73	6.49	3.85	2.58	0.91	0.47	0.20	0.06
> 10,000 to 30,000	≤ 20	Long Beach	10.64	4.84	2.83	1.88	0.66	0.34	0.15	0.05
> 10,000 to 30,000	≤ 20	Lynwood	13.12	5.99	3.51	2.34	0.82	0.43	0.19	0.06
> 10,000 to 30,000	≤ 20	Mission Viejo	13.06	5.94	3.45	2.28	0.79	0.41	0.18	0.06
> 10,000 to 30,000	≤ 20	Palm Springs	10.66	4.81	2.79	1.85	0.64	0.34	0.15	0.05
> 10,000 to 30,000	≤ 20	Perris	15.34	7.07	4.14	2.76	0.96	0.50	0.22	0.07
> 10,000 to 30,000	≤ 20	Pico Rivera	11.21	5.19	3.05	2.03	0.70	0.36	0.16	0.05
> 10,000 to 30,000	≤ 20	Pomona	12.99	5.92	3.47	2.31	0.81	0.42	0.18	0.06
> 10,000 to 30,000	≤ 20	Redlands	14.79	6.75	3.95	2.63	0.91	0.48	0.21	0.07
> 10,000 to 30,000	≤ 20	Reseda	12.97	5.76	3.32	2.19	0.75	0.39	0.17	0.05
> 10,000 to 30,000	≤ 20	Riverside	13.43	6.21	3.65	2.44	0.85	0.45	0.19	0.06
> 10,000 to 30,000	≤ 20	San Bernardino	14.21	6.57	3.86	2.58	0.90	0.47	0.21	0.07
> 10,000 to 30,000	≤ 20	Santa Clarita	12.21	5.65	3.32	2.22	0.78	0.41	0.18	0.06
> 10,000 to 30,000	≤ 20	Upland	13.49	6.31	3.74	2.50	0.88	0.46	0.20	0.06
> 10,000 to 30,000	≤ 20	West LA	13.27	6.10	3.58	2.39	0.83	0.43	0.19	0.06

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.5
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating More Than 12 Hours per Day

Building Area > 10,000 to 30,000 ft^2, Height > 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 10,000 to 30,000	> 20	Anaheim	10.37	5.05	3.04	2.04	0.72	0.38	0.16	0.05
> 10,000 to 30,000	> 20	Azusa	9.67	4.73	2.84	1.91	0.68	0.35	0.15	0.05
> 10,000 to 30,000	> 20	Banning	11.82	6.80	4.44	3.15	1.23	0.68	0.31	0.10
> 10,000 to 30,000	> 20	Burbank	9.57	4.57	2.72	1.82	0.64	0.33	0.14	0.05
> 10,000 to 30,000	> 20	Central LA	8.05	3.92	2.35	1.59	0.56	0.29	0.13	0.04
> 10,000 to 30,000	> 20	Compton	10.71	5.09	3.03	2.03	0.72	0.38	0.16	0.05
> 10,000 to 30,000	> 20	Costa Mesa	12.95	6.18	3.67	2.45	0.86	0.45	0.19	0.06
> 10,000 to 30,000	> 20	Crestline	11.68	5.57	3.31	2.22	0.78	0.41	0.18	0.06
> 10,000 to 30,000	> 20	Fontana	11.55	5.97	3.69	2.52	0.93	0.49	0.22	0.07
> 10,000 to 30,000	> 20	Indio	11.67	6.12	3.82	2.64	0.99	0.54	0.24	0.08
> 10,000 to 30,000	> 20	La Habra	12.51	5.93	3.52	2.35	0.83	0.43	0.19	0.06
> 10,000 to 30,000	> 20	Lake Elsinore	11.87	5.78	3.46	2.33	0.82	0.43	0.19	0.06
> 10,000 to 30,000	> 20	LAX	11.76	5.93	3.61	2.44	0.87	0.46	0.20	0.06
> 10,000 to 30,000	> 20	Long Beach	9.69	4.62	2.75	1.84	0.65	0.34	0.15	0.05
> 10,000 to 30,000	> 20	Lynwood	12.22	5.80	3.44	2.31	0.81	0.43	0.18	0.06
> 10,000 to 30,000	> 20	Mission Viejo	11.47	5.54	3.30	2.21	0.77	0.40	0.17	0.06
> 10,000 to 30,000	> 20	Palm Springs	9.56	4.55	2.69	1.80	0.63	0.33	0.14	0.05
> 10,000 to 30,000	> 20	Perris	12.96	6.39	3.85	2.60	0.93	0.49	0.22	0.07
> 10,000 to 30,000	> 20	Pico Rivera	9.81	4.83	2.90	1.95	0.69	0.36	0.15	0.05
> 10,000 to 30,000	> 20	Pomona	12.14	5.74	3.41	2.28	0.80	0.42	0.18	0.06
> 10,000 to 30,000	> 20	Redlands	13.48	6.43	3.82	2.56	0.90	0.47	0.20	0.07
> 10,000 to 30,000	> 20	Reseda	11.96	5.53	3.23	2.15	0.75	0.39	0.17	0.05
> 10,000 to 30,000	> 20	Riverside	11.92	5.81	3.49	2.35	0.83	0.44	0.19	0.06
> 10,000 to 30,000	> 20	San Bernardino	12.50	6.09	3.66	2.47	0.88	0.46	0.20	0.07
> 10,000 to 30,000	> 20	Santa Clarita	10.36	5.15	3.12	2.11	0.76	0.40	0.17	0.06
> 10,000 to 30,000	> 20	Upland	11.95	5.89	3.56	2.40	0.86	0.45	0.20	0.06
> 10,000 to 30,000	> 20	West LA	12.32	5.89	3.50	2.35	0.82	0.43	0.19	0.06

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 5.6
Dispersion Factors (χ/Q)
for Volume Source Equipment
Operating More Than 12 Hours per Day

Building Area > 30,000 ft^2, Height > 20 ft*

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m^3]/[ton/year])

Source Dimensions*		Location	Downwind Distance (meters)							
Area (ft^2)	Ht (ft)		25	50	75	100	200	300	500	1,000
> 30,000	>20	Anaheim	6.74	3.75	2.42	1.70	0.65	0.35	0.16	0.05
> 30,000	>20	Azusa	6.28	3.51	2.26	1.59	0.61	0.33	0.15	0.05
> 30,000	>20	Banning	8.02	5.13	3.57	2.63	1.11	0.63	0.29	0.10
> 30,000	>20	Burbank	6.17	3.38	2.16	1.51	0.58	0.31	0.14	0.04
> 30,000	>20	Central LA	5.24	2.91	1.87	1.32	0.51	0.27	0.12	0.04
> 30,000	>20	Compton	6.86	3.75	2.40	1.69	0.65	0.35	0.16	0.05
> 30,000	>20	Costa Mesa	8.33	4.56	2.91	2.04	0.77	0.42	0.19	0.06
> 30,000	>20	Crestline	7.52	4.12	2.63	1.84	0.70	0.38	0.17	0.06
> 30,000	>20	Fontana	7.63	4.45	2.94	2.10	0.83	0.46	0.21	0.07
> 30,000	>20	Indio	7.74	4.58	3.06	2.21	0.90	0.50	0.23	0.08
> 30,000	>20	La Habra	8.00	4.37	2.79	1.95	0.74	0.40	0.18	0.06
> 30,000	>20	Lake Elsinore	7.72	4.28	2.75	1.93	0.74	0.40	0.18	0.06
> 30,000	>20	LAX	7.71	4.40	2.87	2.03	0.79	0.43	0.19	0.06
> 30,000	>20	Long Beach	6.22	3.41	2.18	1.53	0.58	0.32	0.14	0.05
> 30,000	>20	Lynwood	7.81	4.27	2.73	1.91	0.73	0.40	0.18	0.06
> 30,000	>20	Mission Viejo	7.44	4.09	2.62	1.83	0.70	0.38	0.17	0.05
> 30,000	>20	Palm Springs	6.11	3.34	2.13	1.49	0.57	0.31	0.14	0.05
> 30,000	>20	Perris	8.43	4.74	3.07	2.16	0.84	0.46	0.21	0.07
> 30,000	>20	Pico Rivera	6.43	3.59	2.31	1.63	0.62	0.33	0.15	0.05
> 30,000	>20	Pomona	7.75	4.23	2.70	1.89	0.72	0.39	0.17	0.06
> 30,000	>20	Redlands	8.64	4.74	3.03	2.12	0.81	0.44	0.20	0.06
> 30,000	>20	Reseda	7.54	4.04	2.55	1.78	0.67	0.37	0.16	0.05
> 30,000	>20	Riverside	7.73	4.30	2.77	1.95	0.75	0.41	0.18	0.06
> 30,000	>20	San Bernardino	8.08	4.51	2.91	2.05	0.79	0.43	0.19	0.06
> 30,000	>20	Santa Clarita	6.76	3.82	2.48	1.75	0.68	0.37	0.17	0.05
> 30,000	>20	Upland	7.77	4.37	2.83	2.00	0.77	0.42	0.19	0.06
> 30,000	>20	West LA	7.91	4.34	2.78	1.95	0.74	0.40	0.18	0.06

*Note: Facilities with building dimensions outside the ranges in Tables 5 must perform Tier 3 or 4 dispersion modeling

Table 6.1
Dispersion Factors (χ/Q) for Acute Hazard Index Point Source Equipment

All Operating Conditions χ/Q Values ([μg/m^3]/[lb/hr])

Stack Ht (ft)	Downwind Distance (meters)							
	25	50	75	100	200	300	500	1,000
≥ 14 to 24*	802.52	335.78	271.20	224.43	95.39	31.94	9.05	3.38
> 24 to 49	507.65	227.75	175.96	132.75	58.26	33.76	16.85	6.44
> 49	35.82	28.25	44.38	51.18	41.24	28.42	15.85	6.51

*Note: Facilities with stack heights less than 14 feet must perform Tier 3 or 4 dispersion modeling

Table 7.1
Dispersion Factors (χ/Q) for Acute Hazard Index Volume Source Equipment

All Operating Conditions χ/Q Values ([μg/m^3]/[lb/hr])

Source Dimensions*		Downwind Distance (meters)							
Area (ft^2)	Ht (ft)	25	50	75	100	200	300	500	1,000
≤ 3,000	≤ 20	875.45	316.53	165.11	107.40	36.79	21.11	10.44	3.99
> 3,000 to 10,000	≤ 20	430.68	204.89	125.46	86.86	33.25	19.75	10.04	3.91
> 3,000 to 10,000	> 20	355.29	196.58	123.09	84.50	30.58	16.12	8.17	3.21
> 10,000 to 30,000	≤ 20	659.28	267.89	149.04	99.31	35.51	20.62	10.29	3.96
> 10,000 to 30,000	>20	500.86	248.96	146.57	96.92	32.88	16.94	8.37	3.25
> 30,000	≥ 20	215.10	135.21	92.18	66.89	26.89	14.80	7.83	3.14

*Note: Facilities with building dimensions outside the ranges here must perform Tier 3 or 4 dispersion modeling

Table – 8.1
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	CAS No	Cancer Potency Factor $(mg/kg\text{-}dy)^{-1}$	MP_R	MP_W	MWAF[1]	REL $\mu g/m^3$	MP_R	MP_W	REL $(\mu g/m^3)$	REL $(\mu g/m^3)$
Acetaldehyde	75-07-0	1.00E-02	1.00	1.00	1	1.40E+02	1.00	1.00	3.00E+02	4.70E+02
Acetamide	60-35-5	7.00E-02	1.00	1.00	1					
Acrolein	107-02-8					3.50E-01	1.00	1.00	7.00E-01	2.50E+00
Acrylamide	79-06-1	4.50E+00	1.00	1.00	1					
Acrylic Acid	79-10-7									6.00E+03
Acrylonitrile	107-13-1	1.00E+00	1.00	1.00	1	5.00E+00	1.00	1.00		
Allyl Chloride	107-05-1	2.10E-02	1.00	1.00	1					
2-Aminoanthraquinone	117-79-3	3.30E-02	1.00	1.00	1					
Ammonia	7664-41-7					2.00E+02	1.00	1.00		3.20E+03
Aniline	62-53-3	5.70E-03	1.00	1.00	1					
Arsenic and Compounds (Inorganic)	7440-38-2	1.20E+01	9.71	4.52	1	1.50E-02	88.03	28.37	1.50E-02	2.00E-01
Arsine	7784-42-1					1.50E-02	1.00	1.00	1.50E-02	2.00E-01
Asbestos[2]	1332-21-4	2.20E+02	1.00	1.00	333					
Benzene	71-43-2	1.00E-01	1.00	1.00	1	3.00E+00	1.00	1.00	3.00E+00	2.70E+01
Benzidine (and Its Salts)	92-87-5	5.00E+02	1.00	1.00	1					
Benzidine Based Dyes	1020	5.00E+02	1.00	1.00	1					
Direct Black	1937-37-7	5.00E+02	1.00	1.00	1					
Direct Blue	2602-46-2	5.00E+02	1.00	1.00	1					
Direct Brown (Technical Grade)	16071-86-6	5.00E+02	1.00	1.00	1					
Benzyl Chloride	100-44-7	1.70E-01	1.00	1.00	1					2.40E+02
Beryllium and Compounds	7440-41-7	8.40E+00	1.00	1.00	1	7.00E-03	1.00	1.00		
Bis(2-Chloroethyl)Ether (Dichloroethyl Ether)	111-44-4	2.50E+00	1.00	1.00	1					
Bis(Chloromethyl)Ether	542-88-1	4.60E+01	1.00	1.00	1					
Potassium Bromate	7758-01-2	4.90E-01	1.00	1.00	1					
1,3-Butadiene	106-99-0	6.00E-01	1.00	1.00	1	2.00E+00	1.00	1.00	9.00E+00	6.60E+02
Cadmium and Compounds	7440-43-9	1.50E+01	1.00	1.00	1	2.00E-02	1.98	1.20		
Carbon Disulfide	75-15-0					8.00E+02	1.00	1.00		6.20E+03
Carbon Tetrachloride (Tetrachloromethane)	56-23-5	1.50E-01	1.00	1.00	1	4.00E+01	1.00	1.00		1.90E+03
Chlorinated Paraffins	108171-26-2	8.90E-02	1.00	1.00	1					

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor (mg/kg-dy)$^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL μg/m^3**	**MP_R**	**MP_W**	**REL (μg/m^3)**	**REL (μg/m^3)**
Chlorine	7782-50-5					2.00E-01	1.00	1.00		2.10E+02
Chlorine Dioxide	10049-04-4					6.00E-01	1.00	1.00		
4-Chloro-o-Phenylenediamine	95-83-0	1.60E-02	1.00	1.00	1					
Chlorobenzene	108-90-7					1.00E+03	1.00	1.00		
Chloroform	67-66-3	1.90E-02	1.00	1.00	1	3.00E+02	1.00	1.00		1.50E+02
Pentachlorophenol	87-86-5	1.80E-02	1.00	1.00	1					
2,4,6-Trichlorophenol	88-06-2	7.00E-02	1.00	1.00	1					
Chloropicrin	76-06-2					4.00E-01	1.00	1.00		2.90E+01
P-Chloro-o-Toluidine	95-69-2	2.70E-01	1.00	1.00	1					
Chromium 6+	18540-29-9	5.10E+02	1.60	1.02	1	2.00E-01	2.44	1.00		
Barium Chromate	10294-40-3	5.10E+02	1.60	1.02	0	2.00E-01	2.44	1.00		
Calcium Chromate	13765-19-0	5.10E+02	1.60	1.02	0	2.00E-01	2.44	1.00		
Lead Chromate	7758-97-6	5.10E+02	1.60	1.02	0	2.00E-01	2.44	1.00		
Sodium Dichromate	10588-01-9	5.10E+02	1.60	1.02	0	2.00E-01	2.44	1.00		
Strontium Chromate	7789-06-2	5.10E+02	1.60	1.02	0	2.00E-01	2.44	1.00		
Chromic Trioxide (as Chromic Acid Mist)	1333-82-0	5.10E+02	1.60	1.02	1	2.00E-03	1.00	1.00		
Copper and Compounds	7440-50-8									1.00E+02
p-Cresidine	120-71-8	1.50E-01	1.00	1.00	1					
Cresols (Mixtures of)	1319-77-3					6.00E+02	1.00	1.00		
m-Cresol	108-39-4					6.00E+02	1.00	1.00		
o-Cresol	95-48-7					6.00E+02	1.00	1.00		
p-Cresol	106-44-5					6.00E+02	1.00	1.00		
Cupferron	135-20-6	2.20E-01	1.00	1.00	1					
Hydrogen Cyanide (Hydrocyanic Acid)	74-90-8					9.00E+00	1.00	1.00		3.40E+02
2,4-Diaminoanisole	615-05-4	2.30E-02	1.00	1.00	1					
2,4-Diaminotoluene	95-80-7	4.00E+00	1.00	1.00	1					
1,2-Dibromo-3-Chloropropane (DBCP)	96-12-8	7.00E+00	1.00	1.00	1					
p-Dichlorobenzene	106-46-7	4.00E-02	1.00	1.00	1	8.00E+02	1.00	1.00		
3,3-Dichlorobenzidine	91-94-1	1.20E+00	1.00	1.00	1					
1,1,-Dichloroethane (Ethylidene Dichloride)	75-34-3	5.70E-03	1.00	1.00	1					

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor (mg/kg-dy)$^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL µg/m^3**	**MP_R**	**MP_W**	**REL (µg/m^3)**	**REL (µg/m^3)**
Di(2-Ethylhexyl)Phthalate (DEHP)	117-81-7	8.40E-03	5.22	1.05	1					
Diethanolamine	111-42-2					3.00E+00	1.00	1.00		
p-Dimethylaminoazobenzene	60-11-7	4.60E+00	1.00	1.00	1					
n,n-Dimethyl Formamide	68-12-2					8.00E+01	1.00	1.00		
2,4-Dinitrotoluene	121-14-2	3.10E-01	1.00	1.00	1					
1,2-Diphenylhydrazine {Hydrazobenzene}	122-66-7	8.8E-01	1.00	1.00	1					
1,4-Dioxane (1,4-Diethylene Dioxide)	123-91-1	2.70E-02	1.00	1.00	1	3.00E+03	1.00	1.00		3.00E+03
Epichlorohydrin (1-Chloro-2,3-Epoxypropane)	106-89-8	8.00E-02	1.00	1.00	1	3.00E+00	1.00	1.00		1.30E+03
1,2-Epoxybutane	106-88-7					2.00E+01	1.00	1.00		
Ethyl Benzene	100-41-4	8.70E-03	1.00	1.00	1	2.00E+03	1.00	1.00		
Ethyl Chloride (Chloroethane)	75-00-3					3.00E+04	1.00	1.00		
Ethylene Dibromide (1,2-Dibromoethane)	106-93-4	2.50E-01	1.00	1.00	1	8.00E-01	1.00	1.00		
Ethylene Dichloride (1,2-Dichloroethane)	107-06-2	7.20E-02	1.00	1.00	1	4.00E+02	1.00	1.00		
Ethylene Glycol	107-21-1					4.00E+02	1.00	1.00		
Ethylene Oxide (1,2-Epoxyethane)	75-21-8	3.10E-01	1.00	1.00	1	3.00E+01	1.00	1.00		
Ethylene Thiourea	96-45-7	4.50E-02	1.00	1.00	1					
Flourides	1101					1.30E+01	5.70	2.85		2.40E+02
Hydrogen Fluoride (Hydrofluoric Acid)	7664-39-3					1.40E+01	6.06	2.99		2.40E+02
Formaldehyde	50-00-0	2.10E-02	1.00	1.00	1	9.00E+00	1.00	1.00	9.00E+00	5.50E+01
Glutaraldehyde	111-30-8					8.00E-02	1.00	1.00		
Ethylene Glycol Butyl Ether – EGBE	111-76-2									1.40E+04
Ethylene Glycol Ethyl Ether – EGEE	110-80-5					7.00E+01	1.00	1.00		3.70E+02
Ethylene Glycol Ethyl Ether Acetate – EGEEA	111-15-9					3.00E+02	1.00	1.00		1.40E+02
Ethylene Glycol Methyl Ether – EGME	109-86-4					6.00E+01	1.00	1.00		9.30E+01

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor (mg/kg-dy)$^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL µg/m^3**	**MP_R**	**MP_W**	**REL (µg/m^3)**	**REL (µg/m^3)**
Ethylene Glycol Methyl Ether Acetate – EGMEA	110-49-6					9.00E+01	1.00	1.00		
Hexachlorobenzene	118-74-1	1.80E+00	1.00	1.00	1					
Hexachlorocyclohexanes	608-73-1	4.00E+00	5.39	1.25	1					
Alpha-Hexachlorocyclohexane	319-84-6	4.00E+00	5.39	1.25	1					
Beta-Hexachlorocyclohexane	319-85-7	4.00E+00	5.39	1.25	1					
Gamma-Hexachlorocyclohexane (Lindane)	58-89-9	1.10E+00	5.39	1.25	1					
n-Hexane	110-54-3					7.00E+03	1.00	1.00		
Hydrazine	302-01-2	1.70E+01	1.00	1.00	1	2.00E-01	1.00	1.00		
Hydrochloric Acid (Hydrogen Chloride)	7647-01-0					9.00E+00	1.00	1.00		2.10E+03
Hydrogen Sulfide	7783-06-4					1.00E+01	1.00	1.00		4.20E+01
Isophorone	78-59-1					2.00E+03	1.00	1.00		
Isopropyl Alcohol (Isopropanol)	67-63-0					7.00E+03	1.00	1.00		3.20E+03
Lead and Compounds (Inorganic)	7439-92-1	4.20E-02	11.41	5.83	1					
Lead Acetate	301-04-2	4.20E-02	11.41	5.83	1					
Lead Phosphate	7446-27-7	4.20E-02	11.41	5.83	1					
Lead Subacetate	1335-32-6	4.20E-02	11.41	5.83	1					
Maleic Anhydride	108-31-6					7.00E-01	1.00	1.00		
Manganese and Compounds	7439-96-5					9.00E-02	1.00	1.00	1.70E-01	
Mercury and Compounds (Inorganic)	7439-97-6					3.00E-02	3.86	2.11	6.00E-02	6.00E-01
Methyl Mercury[3]	593-74-8									
Mercuric Chloride	7487-94-7					3.00E-02	3.86	2.11	6.00E-02	6.00E-01
Methanol	67-56-1					4.00E+03	1.00	1.00		2.80E+04
Methyl Bromide (Bromomethane)	74-83-9					5.00E+00	1.00	1.00		3.90E+03
Methyl Tertiary-Butyl Ether	1634-04-4	1.80E-03	1.00	1.00	1	8.00E+03	1.00	1.00		
Methyl Chloroform (1,1,1-Trichloroethane)	71-55-6					1.00E+03	1.00	1.00		6.80E+04
Methyl Ethyl Ketone (2-	78-93-3									1.30E+04

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor (mg/kg-dy)$^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL µg/m^3**	**MP_R**	**MP_W**	**REL (µg/m^3)**	**REL (µg/m^3)**
Butanone)										
Methyl Isocyanate	624-83-9					1.00E+00	1.00	1.00		
4,4'-Methylene Bis (2-Chloroaniline) (MOCA)	101-14-4	1.50E+00	1.00	1.00	1					
Methylene Chloride (Dichloromethane)	75-09-2	3.50E-03	1.00	1.00	1	4.00E+02	1.00	1.00		1.40E+04
4,4'-Methylene Dianiline (and Its Dichloride)	101-77-9	1.60E+00	7.22	2.47	1	2.00E+01	1.00	1.00		
Methylene Diphenyl Isocyanate	101-68-8					7.00E-01	1.00	1.00		
Michler's Ketone (4,4'-Bis(Dimethylamino)Benzo phenone)	90-94-8	8.60E-01	1.00	1.00	1					
n-Nitrosodi-n-Butylamine	924-16-3	1.10E+01	1.00	1.00	1					
n-Nitrosodi-n-Propylamine	621-64-7	7.00E+00	1.00	1.00	1					
N-Nitrosodiethylamine	55-18-5	3.60E+01	1.00	1.00	1					
n-Nitrosodimethylamine	62-75-9	1.60E+01	1.00	1.00	1					
n-Nitrosodiphenylamine	86-30-6	9.00E-03	1.00	1.00	1					
n-Nitroso-n-Methylethylamine	10595-95-6	2.20E+01	1.00	1.00	1					
n-Nitroso-n-Methylurea	684-93-5	1.2E+02	1.00	1.00	1					
n-Nitroso-n-Ethylurea	759-73-9	2.7E+01	1.00	1.00	1					
n-Nitrosomorpholine	59-89-2	6.70E+00	1.00	1.00	1					
n-Nitrosopiperidine	100-75-4	9.40E+00	1.00	1.00	1					
n-Nitrosopyrrolidine	930-55-2	2.10E+00	1.00	1.00	1					
Nickel and Compounds	7440-02-0	9.10E-01	1.00	1.00	1	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Acetate	373-02-4	9.10E-01	1.00	1.00	0	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Carbonate	3333-67-3	9.10E-01	1.00	1.00	0	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Carbonyl	13463-39-3	9.10E-01	1.00	1.00	0	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Hydroxide	12054-48-7	9.10E-01	1.00	1.00	1	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickelocene	1271-28-9	9.10E-01	1.00	1.00	0	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Oxide	1313-99-1	9.10E-01	1.00	1.00	1	2.00E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Refinery Dust, Pyrometallurgical Process	1146	9.10E-01	1.00	1.00	1	1.40E-02	1.00	1.00	6.00E-02	2.00E-01
Nickel Subsulfide	12035-72-2	9.10E-01	1.00	1.00	0	1.40E-02	1.00	1.00	6.00E-02	2.00E-01

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor $(mg/kg\text{-}dy)^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL $\mu g/m^3$**	**MP_R**	**MP_W**	**REL $(\mu g/m^3)$**	**REL $(\mu g/m^3)$**
Nitric Acid	7697-37-2									8.60E+01
p-Nitrosodiphenylamine	156-10-5	2.20E-02	1.00	1.00	1					
Particulate Emissions from Diesel-Fueled Engines	9901	1.10E+00	1.00	1.00	1	5.00E+00	1.00	1.00		
Perchloroethylene (Tetrachloroethylene)	127-18-4	2.10E-02	1.00	1.00	1	3.50E+01	1.00	1.00		2.00E+04
Phenol	108-95-2					2.00E+02	1.00	1.00		5.80E+03
Phosgene	75-44-5									4.00E+00
Phosphine	7803-51-2					8.00E-01	1.00	1.00		
Phosphoric Acid	7664-38-2					7.00E+00	1.00	1.00		
Phthalic Anhydride	85-44-9					2.00E+01	1.00	1.00		
PCB (Polychlorinated Biphenyls)	1336-36-3	7.00E-02	18.94	13.12	1	4.0E-04	243.90	10.82		
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	32598-13-3	1.30E+01	27.57	13.12	1	4.00E-01	243.90	10.82		
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	70362-50-4	3.90E+01	27.57	13.12	1	1.30E-01	240.21	10.67		
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	32598-14-4	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	74472-37-0	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	31508-00-6	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	65510-44-3	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	57465-28-8	1.30E+04	27.57	13.12	1	4.00E-04	243.90	10.82		
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	38380-08-4	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	69782-90-7	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
2,3',4,4',5,5'-	52663-72-6	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor (mg/kg-dy)$^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL µg/m^3**	**MP_R**	**MP_W**	**REL (µg/m^3)**	**REL (µg/m^3)**
Hexachlorobiphenyl (PCB 167)										
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	32774-16-6	3.90E+03	27.57	13.12	1	1.30E-03	240.21	10.67		
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	39635-31-9	3.90E+00	27.57	13.12	1	1.30E+00	240.21	10.67		
Polychlorinated Dibenzo-p-Dioxins (PCDD)	1086	1.30E+05	25.72	7.58	1	4.00E-05	307.60	6.73		
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1746-01-6	1.30E+05	25.72	7.58	1	4.00E-05	307.60	6.73		
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	40321-76-4	1.30E+05	25.72	7.58	1	4.00E-05	307.60	6.73		
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	39227-28-6	1.30E+04	25.72	7.58	1	4.00E-04	307.60	6.73		
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	57653-85-7	1.30E+04	25.72	7.58	1	4.00E-04	307.60	6.73		
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	19408-74-3	1.30E+04	25.72	7.58	1	4.00E-04	307.60	6.73		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	35822-46-9	1.30E+03	25.72	7.58	1	4.00E-03	307.60	6.73		
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3268-87-9	3.90E+01	25.72	7.58	1	1.30E-01	302.95	6.64		
Polychlorinated Dibenzofurans (PCDF)	1080	1.30E+05	18.19	7.58	1	4.00E-05	154.97	6.73		
2,3,7,8-Tetrachlorodibenzofuran	5120-73-19	1.30E+04	18.19	7.58	1	4.00E-04	154.97	6.73		
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	3.90E+03	18.19	7.58	1	1.30E-03	152.63	6.64		
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	3.90E+04	18.19	7.58	1	1.30E-04	152.63	6.64		
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	1.30E+04	18.19	7.58	1	4.00E-04	154.97	6.73		
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	1.30E+04	18.19	7.58	1	4.00E-04	154.97	6.73		

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor $(mg/kg\text{-}dy)^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL $\mu g/m^3$**	**MP_R**	**MP_W**	**REL $(\mu g/m^3)$**	**REL $(\mu g/m^3)$**
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	1.30E+04	18.19	7.58	1	4.00E-04	154.97	6.73		
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	1.30E+04	18.19	7.58	1	4.00E-04	154.97	6.73		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	1.30E+03	18.19	7.58	1	4.00E-03	154.97	6.73		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	1.30E+03	18.19	7.58	1	4.00E-03	154.97	6.73		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	3.90E+01	18.19	7.58	1	1.30E-01	152.63	6.64		
Polycyclic Aromatic Hydrocarbon (PAH)	1150	3.90E+00	1.00	1.00	1					
Benz(a)Anthracene	56-55-3	3.90E-01	23.12	6.62	1					
Benzo(a)Pyrene	50-32-8	3.90E+00	23.12	6.62	1					
Benzo(b)Fluoranthene	205-99-2	3.90E-01	23.12	6.62	1					
Benzo(j)Fluoranthene	205-82-3	3.90E-01	23.12	6.62	1					
Benzo(k)Fluoranthene	207-08-9	3.90E-01	23.12	6.62	1					
Chrysene	218-01-9	3.90E-02	23.12	6.62	1					
Dibenz(a,h)Acridine	226-36-8	3.90E-01	23.12	6.62	1					
Dibenz(a,h)Anthracene	53-70-3	4.10E+00	7.99	2.48	1					
Dibenz(a,j)Acridine	224-42-0	3.90E-01	23.12	6.62	1					
Dibenzo(a,e)Pyrene	192-65-4	3.90E+00	23.12	6.62	1					
Dibenzo(a,h)Pyrene	189-64-0	3.90E+01	23.12	6.62	1					
Dibenzo(a,i)Pyrene	189-55-9	3.90E+01	23.12	6.62	1					
Dibenzo(a,l)Pyrene	191-30-0	3.90E+01	23.12	6.62	1					
7H-Dibenzo(c,g)Carbazole	194-59-2	3.90E+00	23.12	6.62	1					
7,12-Dimethylbenz(a) Anthracene	57-97-6	2.50E+02	7.99	2.48	1					
1,6-Dinitropyrene	42397-64-8	3.90E+01	23.12	6.62	1					
1,8-Dinitropyrene	42397-65-9	3.90E+00	23.12	6.62	1					
Indeno(1,2,3-c,d)Pyrene	193-39-5	3.90E-01	23.12	6.62	1					
3-Methylcholanthrene	56-49-5	2.20E+01	7.99	2.48	1					
5-Methylchrysene	3697-24-3	3.90E+00	23.12	6.62	1					
Naphthalene	91-20-3	1.20E-01	1.00	1.00	1	9.00E+00	1.00	1.00		
5-Nitroacenaphthene	602-87-9	1.30E-01	7.99	2.49	1					
6-Nitrochrysene	7496-02-8	3.90E+01	23.12	6.62	1					

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor $(mg/kg\text{-}dy)^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL $\mu g/m^3$**	**MP_R**	**MP_W**	**REL $(\mu g/m^3)$**	**REL $(\mu g/m^3)$**
2-Nitrofluorene	607-57-8	3.90E-02	23.12	6.62	1					
1-Nitropyrene	5522-43-0	3.90E-01	23.12	6.62	1					
4-Nitropyrene	57835-92-4	3.90E-01	23.12	6.62	1					
1,3-Propane Sultone	1120-71-4	2.40E+00	1.00	1.00	1					
Propylene (Propene)	115-07-1					3.00E+03	1.00	1.00		
Propylene Glycol Monomethyl Ether	107-98-2					7.00E+03	1.00	1.00		
Propylene Oxide	75-56-9	1.30E-02	1.00	1.00	1	3.00E+01	1.00	1.00		3.10E+03
Selenium and Compounds	7782-49-2					2.00E+01	195.58	23.71		
Hydrogen Selenide	7783-07-5									5.00E+00
Selenium Sulfide	7446-34-6					2.00E+01	195.58	23.71		
Sodium Hydroxide	1310-73-2									8.00E+00
Styrene	100-42-5					9.00E+02	1.00	1.00		2.10E+04
Sulfuric Acid	7664-93-9					1.00E+00	1.00	1.00		1.20E+02
Sulfuric Acid (Sulfur Trioxide)	7446-71-9					1.00E+00	1.00	1.00		1.20E+02
Sulfuric Acid (Oleum)	8014-95-7									1.20E+02
1,1,2,2-Tetrachloroethane	79-34-5	2.00E-01	1.00	1.00	1					
Thioacetamide	62-55-5	6.10E+00	1.00	1.00	1					
Toluene	108-88-3					3.00E+02	1.00	1.00		3.70E+04
Toluene Diisocyantates	26471-62-5	3.90E-02	1.00	1.00	1	7.00E-02	1.00	1.00		
Toluene-2,4-Diisocyanate	584-84-9	3.90E-02	1.00	1.00	1	7.00E-02	1.00	1.00		
Toluene-2,6-Diisocyanate	91-08-7	3.90E-02	1.00	1.00	1	7.00E-02	1.00	1.00		
1,1,2-Trichloroethane (Vinyl Trichloride)	79-00-5	5.70E-02	1.00	1.00	1					
Trichloroethylene	79-01-6	7.00E-03	1.00	1.00	1	6.00E+02	1.00	1.00		
Triethylamine	121-44-8					2.00E+02	1.00	1.00		2.80E+03
Urethane (Ethyl Carbamate)	51-79-6	1.00E+00	1.00	1.00	1					
Vanadium (Fume or Dust)	7440-62-2									3.00E+01
Vanadium Pentoxide	1314-62-1									3.00E+01
Vinyl Acetate	108-05-4					2.00E+02	1.00	1.00		
Vinyl Chloride (Chloroethylene)	75-01-4	2.70E-01	1.00	1.00	1					1.80E+05
Vinylidene Chloride (1,1-Dichloroethylene)	75-35-4					7.00E+01	1.00	1.00		

Table – 8.1 (continued)
Inhalation Cancer Potency (CP), Reference Exposure Level (REL) and Multi Pathway Adjustment Factors (MP)

		Cancer				Chronic			8hr Chronic	Acute
Toxic Air Contaminant	**CAS No**	**Cancer Potency Factor $(mg/kg\text{-}dy)^{-1}$**	**MP_R**	**MP_W**	**MWAF[1]**	**REL $\mu g/m^3$**	**MP_R**	**MP_W**	**REL $(\mu g/m^3)$**	**REL $(\mu g/m^3)$**
Xylenes (Mixed Isomers)	1330-20-7					7.00E+02	1.00	1.00		2.20E+04
m-Xylene	108-38-3					7.00E+02	1.00	1.00		2.20E+04
o-Xylene	95-47-6					7.00E+02	1.00	1.00		2.20E+04
p-Xylene	106-42-3					7.00E+02	1.00	1.00		2.20E+04

CP – cancer potency factor
MP_R – multi-pathway factor (residential)
MP_W - multi-pathway factor (work)
MWAF – molecular weight adjustment factor
REL – Reference Exposure Level

1. *Molecular Weight Adjustment Factor: MWAFs are to be used for calculating cancer risks, chronic, chronic 8-hour, and acute hazard indices. For most of the Hot Spots toxic metals, the OEHHA cancer potency factor applies to the weight of the toxic metal atom contained in the overall compound. This ensures that the cancer potency factor is applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal.*
   So, for example, assume 100 pounds of "Nickel hydroxide" emissions are reported under CAS number 12054-48-7. To get the Nickel atom equivalent of these emissions, multiply by the listed MWAF (0.6332) for Nickel hydroxide: 100 pounds x 0.6332 = 63.32 pounds of Nickel atom equivalent
2. *The value listed in the MWAF column for Asbestos is not a molecular weight adjustment. This is a conversion factor for adjusting mass to fibers or structures. See Appendix C of OEHHA's document The Air Toxics Hot Spots Program Risk Assessment Guidelines for more information.*
3. *ARB removed methyl mercury from the July 3, 2014 Table 1 - Consolidated Table Of OEHHA/ARB Approved Risk Assessment Health Values because it has different chemical properties, potency, and toxicity compared to elemental mercury and mercury salts, and it is not emitted directly from any California facilities.*

Table 9.1
Residential Combined Exposure Factor (CEF)

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	CEF_R
-0.25 to 0	361	10	0.25	1	0.96	676.63
0 to 2	1,090	10	2	1	0.96	
2 to 16	572	3	14	1	0.96	
16 to 30	261	1	14	0.73	0.96	

Table 9.2
Worker Combined Exposure Factor (CEF)

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	CEF_W
16 - 41	230	1	25	0.68	56.26

Table 10.1
Worker Adjustment Factor (WAF)
Operating 12 Hours Per Day or Less

Hours of Operation Per Day	Days of Operation Per Week						
	1	**2**	**3**	**4**	**5**	**6**	**7**
1	4.2	4.2	4.2	4.2	4.2	3.5	3.0
2	4.2	4.2	4.2	4.2	4.2	3.5	3.0
3	4.2	4.2	4.2	4.2	4.2	3.5	3.0
4	4.2	4.2	4.2	4.2	4.2	3.5	3.0
5	4.2	4.2	4.2	4.2	4.2	3.5	3.0
6	4.2	4.2	4.2	4.2	4.2	3.5	3.0
7	4.2	4.2	4.2	4.2	4.2	3.5	3.0
8	4.2	4.2	4.2	4.2	4.2	3.5	3.0
9	3.7	3.7	3.7	3.7	3.7	3.1	2.7
10	3.4	3.4	3.4	3.4	3.4	2.8	2.4
11	3.1	3.1	3.1	3.1	3.1	2.5	2.2
12	2.8	2.8	2.8	2.8	2.8	2.3	2.0

Note: The WAF value for residential/sensitive receptors is 1.0, which assumes exposure of 24 hours/day, 7 days/week

Table 10.2
Worker Adjustment Factor (WAF)
Operating More Than 12 Hours Per Day

Hours of Operation Per Day	Days of Operation Per Week						
	1	**2**	**3**	**4**	**5**	**6**	**7**
13	2.6	2.6	2.6	2.6	2.6	2.2	1.8
14	2.4	2.4	2.4	2.4	2.4	2	1.7
15	2.2	2.2	2.2	2.2	2.2	1.9	1.6
16	2.1	2.1	2.1	2.1	2.1	1.8	1.5
17	2.0	2.0	2.0	2.0	2.0	1.6	1.4
18	1.9	1.9	1.9	1.9	1.9	1.6	1.3
19	1.8	1.8	1.8	1.8	1.8	1.5	1.3
20	1.7	1.7	1.7	1.7	1.7	1.4	1.2
21	1.6	1.6	1.6	1.6	1.6	1.3	1.1
22	1.5	1.5	1.5	1.5	1.5	1.3	1.1
23	1.5	1.5	1.5	1.5	1.5	1.2	1.0
24	1.4	1.4	1.4	1.4	1.4	1.2	1.0

Note: The WAF value for residential/sensitive receptors is 1.0, which assumes exposure of 24 hours/day, 7 days/week

Table – 11.1
Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Toxic Air Contaminant	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												X	
Acrolein												X	
Acrylonitrile												X	
Ammonia												X	
Arsenic & Compounds (Inorganic)[TAC]			X	X						X	X	X	X
Arsine			X	X						X	X	X	X
Benzene[TAC]							X						
Beryllium & Compounds	X							X				X	
1,3-Butadiene[TAC]				X							X		
Cadmium & Compounds[TAC]									X			X	
Caprolactam												X	
Carbon Disulfide				X						X	X		
Carbon Tetrachloride[TAC] (Tetrachloromethane)	X			X						X	X		
Chlorine												X	
Chlorine Dioxide												X	
Chlorobenzene	X			X					X		X		
Chloroform[TAC]	X			X					X		X		
Chloropicrin												X	
Chromium 6+[TAC]							X					X	
Barium Chromate							X					X	
Calcium Chromate							X					X	
Lead Chromate							X					X	
Sodium Dichromate							X					X	
Strontium Chromate							X					X	
Chromium Trioxide (As Chromic Acid Mist)							X					X	
Cresols (Mixtures Of)										X			
m-Cresol										X			
o-Cresol										X			
p-Cresol										X			
Cyanide Compounds (Inorganic)			X		X					X			
Hydrogen Cyanide (Hydrocyanic Acid)			X		X					X			
P-Dichlorobenzene	X								X	X		X	
1,1,-Dichloroethylene …													

Table – 11.1 (continued)
Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Toxic Air Contaminant	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
(See Vinylidene Chloride)													
Diesel Exhaust … (See Particulate Emissions From Diesel-Fueled Engines)													
Diethanolamine							X					X	
N,N-Dimethyl Formamide	X											X	
1,4-Dioxane (1,4-Diethylene Dioxide)	X		X						X				
Epichlorohydrin (1-Chloro-2,3-Epoxypropane)						X						X	
1,2-Epoxybutane			X									X	
Ethyl Benzene	X			X	X				X		X		
Ethyl Chloride (Chlorethane)	X			X							X		
Ethylene Dibromide[TAC] (1,2-Dibromoethane)				X							X		
Ethylene Dichloride[TAC] (1,2-Dichloroethane)	X												
Ethylene Glycol				X					X		X	X	
Ethylene Oxide[TAC] (1,2-Epoxyethane)										X			
Fluorides		X										X	
Hydrogen Fluoride (Hydrofluoric Acid)		X										X	
Formaldehyde[TAC]												X	
Glutaraldehyde												X	
Glycol Ethers													
Ethylene Glycol Ethyl Ether - (EGEE)				X			X				X		
Ethylene Glycol Ethyl Ether Acetate (EGEEA)				X							X		
Ethylene Glycol Methyl Ether - (EGME)				X							X		
Ethylene Glycol Methyl Ether Acetate (EGMEA)				X							X		
N-Hexane										X			
Hydrazine	X				X								
Hydrochloric Acid (Hydrogen Chloride)												X	
Hydrogen Cyanide (Hydrocyanic Acid) (See Cyanide Compounds)													
Hydrogen Bromide ... (See Bromine & Compounds)													
Hydrogen Fluoride (Hydrofluoric Acid)													

Table – 11.1 (continued)
Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Toxic Air Contaminant	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
(See Fluorides & Compounds)													
Hydrogen Sulfide												X	
Isophorone	X			X							X		
Isopropyl Alcohol (Isopropanol)				X					X		X		
Lindane ... (See Gamma-Hexachlorocyclohexane)													
Maleic Anhydride												X	
Manganese & Compounds										X			
Mercury & Inorganic Compounds				X					X	X	X		
Mercuric Chloride				X					X	X	X		
Methanol				X							X		
Methyl Bromide (Bromomethane)				X						X	X	X	
Methyl Tertiary-Butyl Ether	X					X			X				
Methyl Chloroform (1,1,1-Trichloroethane)										X			
Methyl Isocyanate				X							X	X	
Methylene Chloride[TAC] (Dichloromethane)			X							X			
4,4'-Methylene Dianiline (& Its Dichloride)	X					X							
Methylene Diphenyl Isocyanate												X	
Naphthalene												X	
Nickel & Compounds[TAC]				X			X				X	X	
Nickel Acetate				X			X				X	X	
Nickel Carbonate				X			X				X	X	
Nickel Carbonyl				X			X				X	X	
Nickel Hydroxide				X			X				X	X	
Nickelocene				X			X				X	X	
Nickel Oxide				X							X	X	
Nickel Refinery Dust From Pyrometallurgical Process				X			X				X	X	
Nickel Subsulfide				X			X				X	X	
Particulate Emissions From Diesel-Fueled Engines[TAC, E]												X	
Perchloroethylene[TAC] (Tetrachloroethylene)	X								X				
Phenol	X		X						X	X			
Phosphine	X						X		X	X		X	

Table – 11.1 (continued)
Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Toxic Air Contaminant	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Phosphoric Acid												X	
Phthalic Anhydride												X	
Dioxin-Like Polychlorinated Biphenyls (PCBS)[F, G]													
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	X			X	X		X				X	X	
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	X			X	X		X				X	X	
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	X			X	X		X				X	X	
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	X			X	X		X				X	X	
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	X			X	X		X				X	X	
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	X			X	X		X				X	X	
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	X			X	X		X				X	X	
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	X			X	X		X				X	X	
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	X			X	X		X				X	X	
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	X			X	X		X				X	X	
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	X			X	X		X				X	X	
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	X			X	X		X				X	X	
Polychlorinated Dibenzo-P-Dioxins (PCDD) (Treated As 2,3,7,8-TCDD for HRA)[TAC, F]	X			X	X		X				X	X	
2,3,7,8-Tetrachlorodibenzo-P-Dioxin[TAC]	X			X	X		X				X	X	
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	X			X	X		X				X	X	
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	X			X	X		X				X	X	
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	X			X	X		X				X	X	
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	X			X	X		X				X	X	
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	X			X	X		X				X	X	
1,2,3,4,6,7,8,9-Octachlorodibenzo-P-Dioxin	X			X	X		X				X	X	
Polychlorinated Dibenzofurans (PCDF) (Treated As 2,3,7,8-TCDD for HRA)[TAC, F]	X			X	X		X				X	X	
2,3,7,8-Tetrachlorodibenzofuran	X			X	X		X				X	X	
1,2,3,7,8-	X			X	X		X				X	X	

Table – 11.1 (continued)
Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Toxic Air Contaminant	**AL**	**BN**	**CV**	**DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**REP**	**RESP**	**SKIN**
Pentachlorodibenzofuran													
2,3,4,7,8-Pentachlorodibenzofurn	**X**			**X**	**X**		**X**				**X**	**X**	
1,2,3,4,7,8-Hexachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
1,2,3,6,7,8-Hexachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
1,2,3,7,8,9-Hexachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
2,3,4,6,7,8-Hexachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	**X**			**X**	**X**		**X**				**X**	**X**	
Potassium Bromate ... (See Bromine & Compounds)													
Propylene (Propene)												**X**	
Propylene Glycol Monomethyl Ether	**X**												
Propylene Oxide												**X**	
Selenium & Compounds (Other Than Hydrogen H Selenide)	**X**		**X**							**X**			
Selenium Sulfide	**X**		**X**							**X**			
Silica [Crystalline, Respirable]												**X**	
Styrene										**X**			
Sulfuric Acid												**X**	
Sulfuric Trioxide												**X**	
Toluene				**X**						**X**	**X**	**X**	
Toluene Diisocyanates												**X**	
Toluene-2,4-Diisocyanate												**X**	
Toluene-2,6-Diisocyanate												**X**	
Trichloroethylenetac						**X**				**X**			
Triethylamine						**X**							
Vinyl Acetate												**X**	
Vinylidene Chloride (1,1,-Dichloroethylene)	**X**												
Xylenes (Mixed Isomers)						**X**				**X**		**X**	
m-Xylene						**X**				**X**		**X**	

Table – 11.1 (continued)
Target Organs Affected by Toxic Air Contaminants (Chronic Toxicity)

Toxic Air Contaminant	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
o-Xylene						X				X		X	
p-Xylene						X				X		X	

AL: Alimentary system (liver)
BN: Bones and teeth
CV: Cardiovascular system
DEV: Developmental
END: Endocrine system
EYE: Eye
HEM: Hematopoietic system
IMM: Immune system
KID: Kidney
NS: Nervous system
REP: Reproductive system
RESP: Respiratory system
SKIN: Skin

Table – 11.2
Target Organs Affected by Toxic Air Contaminants (Acute Toxicity)

Toxic Air Contaminant	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Acetaldehyde				X					X	
Acrolein				X					X	
Acrylic Acid				X					X	
Ammonia				X					X	
Arsenic & Compounds (Inorganic)[TAC]		X	X				X	X		
Arsine		X	X				X	X		
Benzene[TAC]			X		X	X		X		
Benzyl Chloride				X					X	
1,3-Butadiene[TAC]			X					X		
Caprolactam				X						
Carbon Disulfide			X				X	X		
Carbon Monoxide		X								
Carbon Tetrachloride[TAC] (Tetrachloromethane)	X		X				X	X		
Chlorine				X					X	
Chloroform[TAC]			X				X	X	X	
Chloropicrin				X					X	
Copper & Compounds									X	
Cyanide Compounds (Inorganic)							X			
Hydrogen Cyanide (Hydrocyanic Acid)							X			
1,4-Dioxane (1,4-Diethylene Dioxide)				X					X	
Epichlorohydrin (1-Chloro-2,3-Epoxypropane)				X					X	
Fluorides & Compounds				X					X	
Hydrogen Fluoride (Hydrofluoric Acid)				X					X	
Formaldehyde[TAC]				X						
Glycol Ethers										
Ethylene Glycol Butyl Ether – (EGBE)				X					X	
Ethylene Glycol Ethyl Ether – (EGEE)			X					X		
Ethylene Glycol Ethyl Ether Acetate - (EGEEA)			X				X	X		
Ethylene Glycol Methyl Ether – (EGME)			X					X		
Hydrochloric Acid (Hydrogen Chloride)				X					X	
Hydrogen Cyanide (Hydrocyanic Acid) (See Cyanide Compounds)										
Hydrogen Fluoride (Hydrofluoric Acid) (See										

Table – 11.2 (continued)
Target Organs Affected by Toxic Air Contaminants (Acute Toxicity)

Toxic Air Contaminant	**AL**	**CV**	**DEV**	**EYE**	**HEM**	**IMM**	**NS**	**REP**	**RESP**	**SKIN**
Fluorides & Compounds)										
Hydrogen Selenide (See Selenium & Compounds)										
Hydrogen Sulfide							**X**			
Isopropyl Alcohol (Isopropanol)				**X**					**X**	
Mercury & Compounds (Inorganic)			**X**				**X**	**X**		
Mercuric Chloride			**X**				**X**	**X**		
Methanol							**X**			
Methyl Bromide (Bromomethane)			**X**				**X**	**X**	**X**	
Methyl Chloroform (1,1,1-Trichloroethane)							**X**			
Methyl Ethyl Ketone (2-Butanone)				**X**					**X**	
Methylene Chloride[TAC] (Dichloromethane)		**X**					**X**			
Nickel & Compounds[TAC]						**X**				
Nickel Acetate						**X**				
Nickel Carbonate						**X**				
Nickel Carbonyl						**X**				
Nickel Hydroxide						**X**				
Nickelocene						**X**				
Nickel Oxide						**X**				
Nickel Refinery Dust From The Pyrometallurgical Process						**X**				
Nickel Subsulfide						**X**				
Nitric Acid									**X**	
Nitrogen Dioxide									**X**	
Ozone				**X**					**X**	
Perchloroethylene[TAC] (Tetrachloroethylene)				**X**			**X**		**X**	
Phenol				**X**					**X**	
Phosgene									**X**	
Propylene Oxide			**X**	**X**				**X**	**X**	
Selenium & Compounds										
Hydrogen Selenide				**X**					**X**	
Sodium Hydroxide				**X**					**X**	**X**
Styrene			**X**	**X**				**X**	**X**	
Sulfates									**X**	

Table – 11.2 (continued)
Target Organs Affected by Toxic Air Contaminants (Acute Toxicity)

Toxic Air Contaminant	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Sulfur Dioxide									X	
Sulfuric Acid									X	
Sulfur Trioxide									X	
Oleum									X	
Toluene			X	X			X	X	X	
Triethylamine				X			X			
Vanadium Compounds										
Vanadium (Fume Or Dust)				X					X	
Vanadium Pentoxide				X					X	
Vinyl Chloridetac (Chloroethylene)				X			X		X	
Xylenes (Mixed Isomers)				X			X		X	
m-Xylene				X			X		X	
o-Xylene				X			X		X	
p-Xylene				X			X		X	

AL: Alimentary system (liver)
CV: Cardiovascular system
DEV: Developmental
EYE: Eye
HEM: Hematopoietic system
IMM: Immune system
NS: Nervous system
REP: Reproductive system
RESP: Respiratory system
SKIN: Skin

Table – 11.3
Target Organs Affected by Toxic Air Contaminants (8-hour Toxicity)

Toxic Air Contaminant	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												X	
Acrolein												X	
Arsenic And Compounds (Inorganic)[TAC]			X	X						X	X	X	X
Arsine			X	X						X	X	X	X
Benzene[TAC]							X						
1,3-Butadienetac				X							X		
Caprolactam												X	
Formaldehyde[TAC]												X	
Manganese And Compounds										X			
Mercury And Compounds (Inorganic)				X					X	X	X		
Mercuric Chloride				X					X	X	X		
Nickel And Compounds[TAC]								X				X	
Nickel Acetate								X				X	
Nickel Carbonate								X				X	
Nickel Carbonyl								X				X	
Nickel Hydroxide								X				X	
Nickelocene								X				X	
Nickel Oxide								X				X	
Nickel Refinery Dust From The Pyrometallurgical Process								X				X	
Nickel Subsulfide								X				X	

AL: Alimentary system (liver)
CV: Cardiovascular system
DEV: Developmental
EYE: Eye
HEM: Hematopoietic system
IMM: Immune system
NS: Nervous system
REP: Reproductive system
RESP: Respiratory system
SKIN: Skin

Table – 12.1
Meteorological Monitoring Stations in the South Coast Air Basin

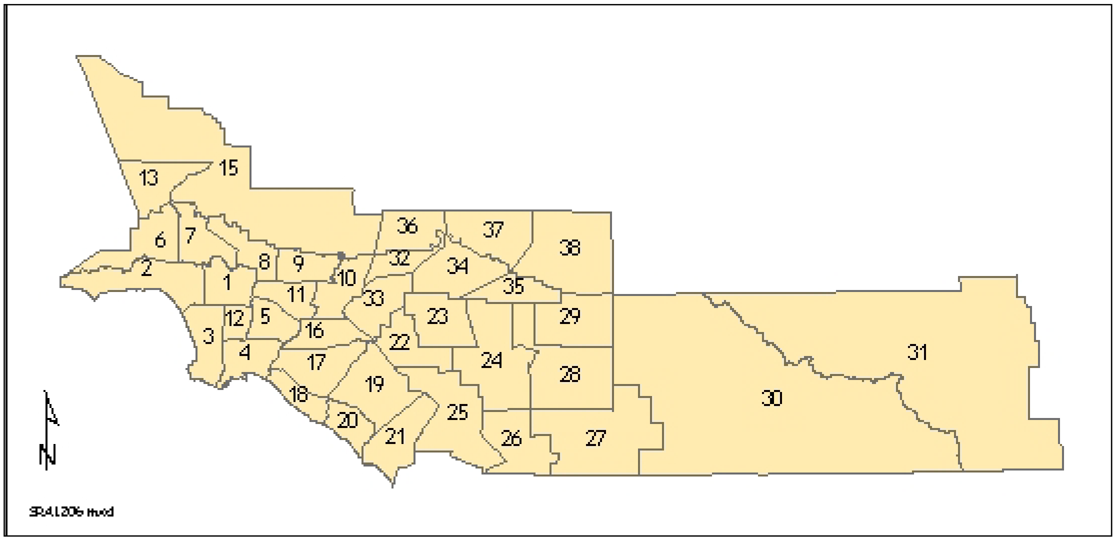
	UTM Coordinates (km)		Lat./Long. Coordinates		Elevation
Station name	Easting	Northing	Latitude	Longitude	(m)
Anaheim	413.14	3743.57	33:49:50	117:56:19	41
Azusa	414.81	3777.47	34:08:11	117:55:26	182
Banning	513.10	3753.19	33:55:15	116:51:30	660
Burbank	378.62	3782.24	34:10:33	118:19:01	175
Central LA	386.79	3770.00	34:03:59	118:13:36	87
Compton	388.59	3751.88	33:54:05	118:12:18	22
Costa Mesa	414.16	3726.19	33:40:26	117:55:33	20
Crestline	474.62	3788.76	34:14:29	117:16:32	1387
Fontana	454.62	3773.19	34:06:01	117:29:31	367
Indio	572.67	3729.90	33:42:30	116:12:57	-4
La Habra	411.98	3754.08	33:55:31	117:57:08	82
Lake Elsinore	469.33	3726.13	33:40:35	117:19:51	406
LAX	367.83	3757.80	33:57:15	118:25:49	42
Long Beach	389.99	3743.04	33:49:25	118:11:19	30
Lynwood	388.07	3754.73	33:55:44	118:12:39	29
Mission Viejo	437.39	3721.17	33:37:49	117:40:30	170
Palm Springs	542.46	3745.73	33:51:10	116:32:28	171
Perris	478.91	3738.58	33:47:20	117:13:40	442
Pico Rivera	401.31	3763.61	34:00:37	118:04:07	58
Pomona	430.78	3769.61	34:04:00	117:45:00	270
Redlands	486.36	3768.50	34:03:32	117:08:52	481
Reseda	358.76	3785.11	34:11:57	118:31:58	228
Riverside	461.64	3762.10	34:00:02	117:24:55	250
San Bernardino	474.76	3773.82	34:06:24	117:16:25	305
Santa Clarita	359.48	3805.52	34:23:00	118:31:42	375
Upland	441.96	3773.66	34:06:14	117:37:45	379
West LA	365.54	3768.52	34:03:02	118:27:24	97

Table - 12.2
Meteorological Stations for Each Source/Receptor Area

Meteorological Station	Source/ Receptor Area	Meteorological Station	Source/ Receptor Area
Anaheim	17	Compton/Lynwood	12
Azusa	8, 9	Mission Viejo	19, 21
Banning	29	Perris	24, 28
Burbank	7	Palm Springs	30, 31
Central LA	1	Pico Rivera	5, 11
Crestline	37	Pomona	10
Costa Mesa	18, 20	Redlands	35, 38
Fontana	34	Reseda	6
Indio	30	Riverside	22, 23
La Habra	16	Santa Clarita	13, 15
Lake Elsinore	25, 26, 27	San Bernardino	34
LAX	3	Upland	32, 33, 36
Long Beach	4	West LA	2

Figure 1
Meteorological Monitoring Stations in the South Coast Air Basin

Figure 2
Source/Receptor Areas



ATTACHMENT K

South Coast Air Quality Management District

DRAFT Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act

DRAFT

June 5, 2015

TABLE OF CONTENTS

1. INTRODUCTION 1

2. OVERVIEW OF THE AB2588 PROGRAM 2

3. GUIDELINES 4

3.1. Initial Toxics Inventory 4

3.2. Prioritization 6

3.3. Emission Estimates Approved for Health Risk Assessment 8

3.4. Uncertainty Analyses and Alternative Health Risk Assessments 10

3.5. Reporting Format 11

3.6. Notification and Risk Reduction Levels 11

3.7. Maximum Exposed Individual 11

3.8. Zone of Impact 12

3.9. Land Use Considerations 12

3.10. Maps 12

3.11. Air Dispersion Modeling 13

3.12. Risk Assessment 19

4. REFERENCES 21

APPENDICES

A. AB2588 List of Toxics 24

B. Elements of Air Toxics Inventory Report 30

C. Outline for the Health Risk Assessment Report 32

D. HRA Review Check List 40

LIST OF TABLES

1. Reported TACs and ODCs under the AER Program 4
2a. Emissions Reporting Thresholds for Any Industry 5
2b. Emissions Reporting Thresholds for Specific Industries 5
3. Priority Score Categories 6
4. Public Notification and Risk Reduction Levels 11
5. Required Source Information 14
6. Summary of SCAQMD Dispersion Modeling Guidance 15
7. Location of Meteorological Stations 17
8. Meteorological Stations for Each Source Receptor Area 18
9. Maximum Receptor Spacing Requirements for Fenceline Receptors 19
10. Files that Must be Provided with HRA Submittals 21
11. Summary of SCAQMD Health Risk Assessment Guidance 22
12. Adjustment Factors for Off-site Worker Ground-level Concentrations 23

LIST OF FIGURES

1. Overview of the Hot Spots Program 3
2. Locations of Meteorological Stations 16
3. Source Receptor Areas 16

1. INTRODUCTION

This guidance document is a supplement to a document prepared by the State of California Office of Environmental Health Hazard Assessment (OEHHA) entitled, "Air Toxics Hot Spots Program Risk Assessment Guidelines" (referred to as the OEHHA Guidelines).[1] Facilities required to submit risk assessments to the South Coast Air Quality Management District (SCAQMD) under the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB2588) must follow the OEHHA Guidelines pursuant to Health and Safety Code 44360(b)(2). While the information provided in the OEHHA Guidelines is complete, there are several areas in the document that refer the user to their local air district for specific or additional requirements. This supplemental guidance addresses those areas and other issues that have arisen during the implementation of the AB2588 Program.

A certification form must be submitted to the SCAQMD with all documents and correspondence relating to health risk assessments.[2]

Please visit SCAQMD's AB2588 webpage provided below for additional information, ~~and~~ documents, and any ~~. Q~~questions regarding this document, health risk assessment methodology, and other AB2588 issues. ~~should be directed to Ian MacMillan at (909) 396-3244, or via email at imacmillan@aqmd.gov.~~

Send correspondence to:

South Coast Air Quality Management District -

~~ATTN: Ian MacMillan~~
~~Program Supervisor —~~AB2588
21865 Copley Drive
Diamond Bar, CA 91765

[1] OEHHA. 2015. http://oehha.ca.gov/air/hot_spots/hotspots2015.html
[2] http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588/forms

2. OVERVIEW OF THE AB2588 PROGRAM

In 1987, the California legislature adopted the Air Toxics "Hot Spots" Information and Assessment Act; also known as Assembly Bill 2588 (or AB2588). The goals of the Act are to collect emissions data, identify facilities having localized impacts to determine health risks, and notify affected individuals. In 1992, the California legislature added a risk reduction component, the Facility Air Toxic Contaminant Risk Audit and Reduction Plan (or SB 1731), which requires facilities to develop and implement measures to reduce impacts if risks are found above thresholds specified by SCAQMD. There are five important components to the AB2588 program as follows:

- *Emission Reporting* – Facilities subject to AB2588 submit an air toxics inventory every four years through the Annual Emissions Reporting Program.
- *Prioritization* - From the reported toxic emissions, SCAQMD staff prioritizes facilities, using a procedure approved by the Governing Board, into three categories: high, intermediate, and low priority. High priority facilities are then asked to prepare and Air Toxics Inventory Report (ATIR)
- *Risk Assessment* - High priority facilities must prepare a Health Risk Assessment (HRA)
- *Public Notice* - If the risk reported in the HRA exceeds specific thresholds, then the facility is required to provide public notice to the affected community.
- *Risk Reduction* - Facilities with health risks above the action risk levels in Rule 1402 must reduce their risks below the action risk levels.

Figure 1 below provides an overview of the AB2588 program and the two paths by which a facility becomes subject to AB2588 requirements.

2.1 Background

There are four steps involved in the risk assessment process; 1) hazard identification, 2) exposure assessment, 3) dose-response assessment, and 4) risk characterization. Each step is briefly discussed below.

Hazard Identification

For air toxics sources, hazard identification involves determining the type of adverse health effect associated with exposure of the pollutant of concern emitted by a facility, including whether a pollutant is considered human carcinogen or a potential human carcinogen.

Exposure Assessment

The purpose of exposure assessment is to estimate the extent of public exposure to emitted substances for potential cancer, noncancer health hazards for chronic and acute, and repeated 8-hour exposures. This involves estimation of long-term (annual), short-term (1-hour maximum), and 8-hour average exposure levels.

Dose-Response Assessment

Dose-response assessment is the process of characterizing the relationship between exposure to a chemical by its modeled concentration. Dose can be calculated as follows:

Dose = Concentration x Exposure

Risk Characterization

This is the final step of the risk assessment in which the information from exposure assessment and dose-response assessment are combined to assess total risk to the surrounding community.

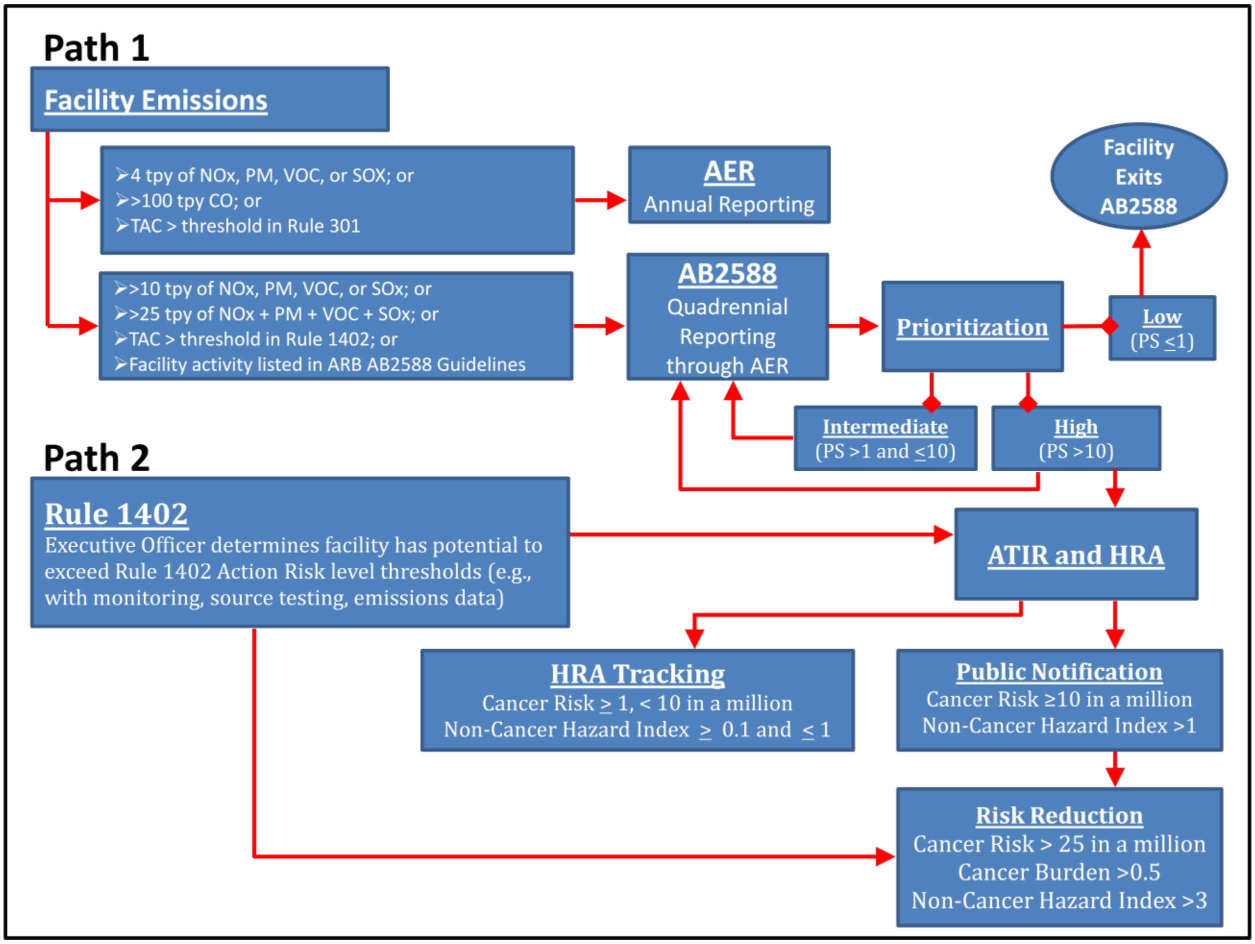


Figure 1. Overview of the AB2588 Program and illustration of the two paths by which a facility becomes subject to AB2588 requirements.

2.2 Revisions

The major revisions to this document include incorporation of updated risk assessment methodologies pursuant to OEHHA's 2015 update of its Guidance Manual. These include:

- Increased risk to children from cancer causing substances;
- Higher breathing rates for children;
- Lower exposure durations for residents and workers;
- Different multipathway calculation methodologies;
- Incorporation of AERMOD air dispersion model into HARP2 in place of the previously used ISCST3 model;
- Inclusion of the 8-hr chronic non-cancer risk estimate;
- Calculation of risk in individual age bins (e.g., third trimester, 0-2 years, etc..) rather than a single lifetime calculation;

These items are described in greater detail in the following sections. The first three come from the recent revisions to OEHHA's Guidance Manual. The last one is unique to the SCAQMD and these procedures.

3. GUIDELINES

Guidance and procedures are provided for various aspects of the AB2588 program in this section.

3.1. Initial Toxics Inventory

The Annual Emissions Reporting (AER) software is used to:

- Satisfy the quadrennial (once in four year) reporting requirements of the AB2588 Program, and
- Get an initial inventory of air toxics from facilities new to the AB2588 Program.

Facilities in the AB2588 Program are required to report their toxic emissions to the SCAQMD once every four years. Toxics emission reporting for the AB2588 Program is incorporated into the SCAQMD's AER Program. Under the AER Program, facilities which have the potential to emit: 1) four tons per year (tpy) or more of VOC, NO_X, SO_X, PM, or 100 tpy or more of CO; or 2) any one of 24 toxic air contaminants (TACs) and ozone depleting compounds (ODCs) listed in Table 2, are required to report their emissions annually to the SCAQMD. Facilities subject to the AER Program calculate and report their emissions based on their throughput data (e.g., fuel usage, material usage, etc.), appropriate emission factors, and control efficiency (if applicable). The software used for reporting emissions is available on the SCAQMD website.[3] There are approximately 2,000 facilities in the AER Program.

Table 1. Reported TACs and ODCs under the AER Program.

Ammonia	Chlorinated dioxins & dibenzofurans	Lead
Asbestos	Chlorofluorocarbons	Methylene chloride
Arsenic (inorganic)	1,4-Dioxane	Nickel
Benzene	Ethylene dibromide	Perchloroethylene
Beryllium	Ethylene dichloride	Polynuclear aromatic hydrocarbons (PAH)
1,3-Butadiene	Ethylene oxide	1,1,1-Trichloroethane
Cadmium	Formaldehyde	Trichloroethylene
Carbon tetrachloride	Hexavalent chromium	Vinyl chloride

Currently, the data collected over the years in the AER program is used to determine candidates for the AB2588 Program. Facilities that meet one of the following conditions are required to prepare a comprehensive toxics inventory if:

- They emit 10 tpy or more of VOC, NOx, SOx, or PM;
- They emit 25 tpy or more of a combination of VOC, NOx, SOx, and PM;
- They emit less than 10 tpy of VOC, NOx, SOx, or PM, but the facility activity is listed in ARB's Emission Inventory Criteria and Guidelines for the Air Toxics "Hot Spots" Program[4];
- Their emissions exceed one or more of the reporting thresholds in Table ~~3a~~ 2a or ~~3b~~2b; or
- The Executive Officer of SCAQMD determines that emissions levels from the facility have the potential to cause an exceedance of risk reduction thresholds.

Facilities must report emissions of over 170 substances (Appendix A), provide the distances to the

[3] http://www.aqmd.gov/home/regulations/compliance/annual-emission-reporting
[4] http://www.arb.ca.gov/ab2588/2588guid.htm

nearest residential and commercial receptors, and note the facility operating conditions (e.g., operating hrs/day, operating days/week, operating weeks/yr) using the AER software. It is critical that facilities estimate their toxic emissions as precisely and accurately as possible. These reported emissions are used to prioritize the facility as discussed in the next section. A facility's prioritization score determines its fees and if it is necessary to prepare a HRA.

Table 2a. Emissions Reporting Thresholds for Any Industry*

Toxic Air Contaminant (Any Industry)	Threshold (lbs/yr)
1,3 Butadiene	2
Benzene	14
Cadmium	0.09
Formaldehyde	67
Hexavalent Chromium	0.002
Methylene Chloride	400
Nickel	1.5
Perchloroethylene	67

Table 2b. Emission Reporting Thresholds for Specific Industries*

Industry	TAC	Threshold (lbs/yr)
Biomedical Sterilization	Ethylene Oxide	4.5
Dry Cleaning	Perchloroethylene	67
	Methylene Chloride	400
Gas Stations	Benzene	14
Metal Finishing	Hexavalent Chromium	0.002
	Cadmium	0.09
	Nickel	1.5
	Copper	500
Motion Picture Film Processing	Perchloroethylene	67
Rubber	Chlorinated Dibenzofurans, Benzene, Xylenes, Toluene, Phenol, and Methylene Chloride	1,000 lbs of rubber product processed per year
Wood Stripping	Methylene Chloride	400
	DEHP	32
	Glycol Ether and their acetates + EGME + EGEEA	500
	EGBE + EGEE	2,000
	EGMEA + EGME	1,000

* The emission levels are back-calculated from cancer risks of 25 in one million and/or a hazard index of 3 using the risk assessment procedures for Rule 1401 and 212.

3.2. Prioritization

AB2588 requires the SCAQMD staff to designate high, intermediate, and low priority categories and include each facility within the appropriate category based on its individual priority. Per the requirements of AB2588, the SCAQMD's prioritization procedure considers the potency, toxicity, and quantity of hazardous materials released from the facility; the proximity of the facility to potential receptors, including, but not limited to, hospitals, schools, daycare centers, worksites and residences; and any other factors that the SCAQMD determines that the facility may pose a significant risk to receptors. The SCAQMD procedures also include adjustment factors for exposure period, averaging times, and the treatment of multi-pathway pollutants. The prioritization procedures are available at the SCAQMD's web site.[5]

A facility receives two scores: one for carcinogenic effects and the other for non-carcinogenic effects. The facility is then ranked based on the higher of the two scores. Three categories are used in the ranking: high priority (Category A), intermediate priority (Category B), and low priority (Category C). Facilities designated as high priority are required to submit heath risk assessments to determine the risk to their surrounding community once they have been notified by SCAQMD staff of their priority score. Facilities ranked as intermediate priority are considered to be "District Tracking" facilities, which are then required to submit complete toxics inventories once every four years, using the AER software. Facilities ranked as low priority are exempt from reporting. Priority scores are re-calculated each time a facility updates its toxic emission inventory. Table 4 summarizes the priority score categories and the actions required by each category.

Table 3. Priority Score Categories

Category	Facility Priority Score (PS)	Actions
High Priority (Category A)	PS > 10	Prepare HRA; update emissions quadrennially
Intermediate Priority (Category B)	1 < PS ≤ 10	Update emissions quadrennially
Low Priority (Category C)	PS ≤ 1	Exempt from AB2588 Program

The SCAQMD staff considers requests from Category A facilities to be reprioritized after detection of errors or other problems with their initial inventory report. The following sections discuss the criteria used for evaluating requests to reprioritize a facility.

The facility is informed, in writing, if their category status has been changed. If a Category A facility has not been informed in writing of a change in category, a health risk assessment must be prepared and submitted to the SCAQMD.

3.2.1. Receptor Distance

One of the factors considered when prioritizing facilities into Category A, B or C is the receptor distance. All facilities must report the distances to the nearest residential and commercial receptors as part of their AER submittal. If receptor distances are not provided, then default values (conservative receptor distances) are used by the SCAQMD staff to prioritize that

[5] http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588/prioritization

facility. If a facility operator believes that their facility was incorrectly categorized due to an incorrect or default receptor distance, then the facility must prepare and submit a signed copy of the Receptor Proximity Form which can be downloaded from the website.[6]

3.2.2. Computational Errors

If computational errors or conservative assumptions were made in the initial inventory report that overestimated emissions and resulted in Category A classification, the facility may correct the errors and submit the corrected estimates and supporting documentation to the AB2588 staff. In order to be considered, the facility must include in their submission the nature of the error and calculations showing how the original emission estimate was determined and how the correction changes this value.

Please note that the SCAQMD must use process rates and emissions from the initial reporting year to prioritize a facility. Changes in emissions estimates due to changes in process rates submitted for the update cannot be used to re-categorize a facility.

3.2.3. New Source Test Results

If new source test results are available and have been previously submitted to and approved by SCAQMD, then the approved source test results may be used with the process rates in the initial inventory report to recalculate emissions and the priority score of Category A facilities.

3.2.4. Equipment/Process Shutdowns or Process Modifications

If equipment or processes with toxic emissions have been shut down prior to Category A classification and the permits have been surrendered, then these emission reductions may be used to recalculate the priority score of Category A facilities. Evidence for these emission reductions must include copies of letters sent to the SCAQMD requesting emission reduction credits and/or termination of SCAQMD permits.

If a process has been modified since the initial inventory report and the equipment or process emits a different quantity of a toxic substance, and the facility has applied for and received a permit modification reflecting this change, then the emission reduction for that substance may be used to recalculate the priority score.

All supporting documentation regarding equipment shutdowns and process modifications must be received by the AB2588 Section.

3.2.5. Facility Closures

If the entire facility is closed prior to Category A classification or if a facility is scheduled for complete closure, this information must be reported to the AB2588 Section. Upon review, the SCAQMD staff will make a decision whether the facility should submit a risk assessment. Factors that must be considered include the status of permits granted to the facility by the SCAQMD and the nature of any ongoing activities at the facility. Unless a facility is informed by

[6] http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588/forms

the SCAQMD in writing that an AB2588 health risk assessment is no longer required, the facility operator must submit a health risk assessment by the date required.

3.2.6. Change of Ownership/Operator

If there has been a change in ownership or operator, the new owner/operator must submit a health risk assessment unless the facility no longer emits any substances required to be reported under AB2588. In such case, the new facility owner/operator must provide the SCAQMD staff the necessary documentation to be exempt from reporting requirements of AB2588.

3.3. Emission Estimates Approved for Health Risk Assessment

Facilities subject to the submittal of health risk assessments under AB2588 Program must estimate and submit their detailed toxic emissions using ARB's Hotspots Analysis and Reporting Program version 2 (HARP2)~~.~~[7]~~-~~, or the latest approved version of the program. This detailed Air Toxics Inventory Report (ATIR) should include, at a minimum, the elements outlined in Appendix B. OEHHA has grouped the substances to be reported into three groups as shown in Appendix A of the OEHHA Guidelines.[8] There are distinct reporting requirements for the three groups as follows:

Appendix A-I Substances – All emissions of these substances must be quantified in the HRA including those calculated in the inventory report as below the degree of accuracy or below detection limits.

Appendix A-II Substances – Emissions of these substances do not need to be quantified in the HRA; however, facilities must report whether the substance is used, produced, or otherwise present on-site. These substances can be simply listed in a table in the HRA.

AppendixA-III Substances – These substances only need to be reported in a table in the HRA if they are manufactured by the facility.

The intent of the AB2588 program is that facilities perform risk assessments using the process rates and emissions data submitted in their initial inventory report (see Section 3.1). The SCAQMD receives requests from facilities to use process rates and emissions data other than those reported in their initial inventory report. As a general policy, the SCAQMD will allow emission changes only if (1) the changes conform to one of the situations discussed in the following sections and (2) any emission increases are also included.

3.3.1. Computational Errors

Computational errors in the air toxics inventory report must be reported to the SCAQMD as soon as detected. Written requests to correct errors for inclusion in the risk assessment must include documentation of the nature of the error and calculations to show how the original emission value was determined and how correcting the computational error changes this value.

[7] http://www.arb.ca.gov/toxics/harp/harp.htm
[8] http://oehha.ca.gov/air/hot_spots/hotspots2015.html

3.3.2. Emission Reductions

Emissions reductions must be verified to be considered as an allowable change. Verified emission reductions are those which are permanent, can be substantiated, and must be enforceable. Verification requirements include specifications in the SCAQMD permit issued to the facility, a surrender of the existing SCAQMD permit, or reductions as required by SCAQMD rule(s). Letters of intent or internal memos mandating new company policy are not considered verifiable emission reductions.

Examples of verifiable emission reductions include:

- A previously operating permitted source has been shut down and therefore has no emissions. In order for this to be considered as a verified emissions reduction, the facility must have surrendered the permit to the SCAQMD. If a facility chooses to retain the permit for possible use of the equipment in the future, that source cannot be considered a permanent verified emissions reduction. Please send a copy of the letter requesting inactivation of the permit and any other supporting documentation to the AB2588 Section of Planning.
- A listed substance is no longer used and therefore not emitted in a process at the facility. The permit conditions have previously been modified to reflect this change. A copy of the modified permit or, if not yet available, a copy of the 400A application form requesting a change of permit conditions and a copy of the check for filing fee submitted to the SCAQMD must be sent to the AB2588 Section.
- Pollution control equipment which has been issued a permit-to-construct, has been installed, and is now in operation. Provide a copy of the permit-to-construct (and permit-to-operate, if issued), and show calculations for emission reductions. Provide the references for any emission factors used in the calculations. If source testing data was used to calculate the emissions, provide a copy of the source test protocol and all documentation relating to the results.
- Requirements of new SCAQMD rules have resulted in permanent and enforceable reductions. Provide documentation on how reductions are or will be achieved by a specified date.

If the facility wishes to use verified emission reductions in their risk assessment, documentation of these verified changes must be provided. <u>Note that new emissions or emission increases, due to process changes or new equipment, must also be quantified and included in any risk assessment which incorporates emission reductions since the initial inventory was prepared.</u>

3.3.3. Modifications in Progress

Any modifications to reduce risk must be in place and verifiable in order to be considered in calculating allowable emissions reductions. Documentation of the reductions must be submitted to the SCAQMD along with the health risk assessment. Examples of such modifications include the following:

- A permit to construct has been granted for control equipment but the equipment is not yet in place and/or a permit to operate has not been issued. In order to be considered, a copy of the permit and a letter indicating intent to construct must be provided to the AB2588 Section.

- A listed substance will be replaced or substituted. The facility must apply for a change in permit conditions, if applicable, and have the change in place. A copy of the 400A application form submitted requesting a change of permit conditions and a copy of the check for the filing fee must also be sent to the AB2588 Section.

For these "reductions in progress", the facility should contact the AB2588 Section to obtain approval and determine if the intended changes can be considered as verifiable emission reductions. Upon approval, the facility must estimate cancer risk, cancer burden, and hazard indices for both the initial emissions and for the estimated emissions after the proposed future reductions are complete. The two risk estimates must be presented separately in the HRA submitted to the SCAQMD. The dual estimate provides a "back up" in case reductions proposed by the facility are not implemented as planned.

3.3.4. New Source Testing Data

Data from new or yet to be completed source tests will not be approved for use in the preparation of the required risk assessment. However, if a facility has already conducted and completed the source test with an SCAQMD-approved source test protocol, and all supporting documentation is provided to the AB2588 Section, it may be considered for approval. The SCAQMD will notify the facility in writing if new source test results are approved for use in the AB2588 HRA. Otherwise, the facility cannot use the new source testing data. Please call the AB2588 section if you submit a request and have not been notified regarding approval before submitting the HRA.

If a facility wishes to provide unapproved source test data for informational purposes only, it must be presented in an alternate HRA (i.e., as an appendix to the HRA). The alternate HRA must be presented with separate findings and discussion of cancer risk and hazard indices. Failure to completely separate the alternate HRA from the required analysis is grounds for rejection of the HRA.

3.3.5. Diesel Particulate Matter Emissions

Diesel particulate matter emissions were identified as a toxic air contaminant (TAC) by California Air Resources Board (CARB) in 1998, and were added to SCAQMD Rule 1401 list of compounds on March 7, 2008. Under the current AB2588 Air Toxics “Hot Spots” Emission Inventory Criteria and Guidelines Regulation, amended on August 27, 2007, facility operators are required to include health risk impacts of any diesel exhaust particulate emissions from stationary emergency and prime compression ignition internal combustion engines, as well as portable diesel engines. Please clearly identify emergency diesel internal combustion engines (DICEs) and their corresponding emissions. This is essential because, on January 5, 2007, the SCAQMD Governing Board adopted separate public notification procedures for emergency DICEs.[9]

3.4. Uncertainty Analyses and Alternative Health Risk Assessments

The OEHHA guidelines describe uncertainty analyses (or risk assessments with alternate assumptions) that may be provided at the discretion of the SCAQMD. The SCAQMD staff will allow such analyses to be included as one of the appendices to the facility's risk assessment

[9] http://www3.aqmd.gov/hb/2007/January/070128a.html

document. This analysis would be a supplement to the primary risk assessment that is carried out using the assumptions presented in the OEHHA guidelines and the guidance given here. Deviations from the OEHHA Tier-1 point estimate methodology must be described in detail at the beginning of the appendix and the reasons for the alternative assumptions must also be described in detail with supporting documentation.

All analyses and discussion relating to an alternative analysis must appear under a separate title such as "Alternative Analysis" in an appendix to the risk assessment document. If an alternative risk analysis is mixed together with the Tier-1 analysis and not presented in a separate appendix of the document as required by OEHHA and SCAQMD guidelines, the risk assessment document will be considered unacceptable and returned to the facility owner/operator for revision.

3.5. Reporting Format

The reporting format for the HRA must follow the detailed outline presented in Appendix C. A completed Health Risk Assessment Summary must be included in the executive summary of all health risk assessments submitted to the SCAQMD; a sample of the form can be downloaded from the SCAQMD's AB2588 website.[10] The detailed HRA outline provided in Appendix C lists the HARP2 computer files to be included in a CD with the HRA. Three (3) copies of the HRA and three (3) copies of CD(s) should be sent to SCAQMD staff. The HRA, in electronic form (i.e., pdf format), should also be included on the CD.

Cancer risk values should be reported to the nearest tenth and should be rounded up from 5 (e.g., 5.05 in a million is rounded up to 5.1 in a million). Non-cancer risk values should be reported to the nearest hundredth and should be rounded up from 5 (e.g., a hazard index of 0.105 is rounded to 0.11)

3.6. Notification and Risk Reduction Levels

The SCAQMD Governing Board has adopted risk levels for purposes of notification pursuant to the AB2588 program. In addition, SCAQMD Rule 1402 establishes action risk levels that require risk reduction; the levels are summarized in Table 5. Additional information regarding the SCAQMD's notification procedures are available on the web site.[11]

Table 4. Public Notification and Risk Reduction Levels.

Risk Variable	Public Notification Levels	Risk Reduction Levels
Cancer risk	≥ 10 in a million	≥ 25 in a million
Non-cancer risk	Hazard index > 1	Hazard index ≥ 3
Cancer burden	--	≥ 0.5 excess cancer cases

[10] http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588/forms

[11] http://www.aqmd.gov/home/about/public-notices/ab-2588-notices

3.7. Maximum Exposed Individual

To identify the location of the maximum exposed individual, it is necessary to examine current land use and allowable land use in the vicinity of the point of maximum impact (residential, commercial/industrial or mixed use). Currently, the use of block group or census tract centroids as surrogates for the maximum exposed individual does not provide sufficient spatial resolution and will not be approved.

Cancer risk and non-cancer chronic hazard indices (HIs) must be provided for both the most exposed residential and the most exposed commercial/industrial receptors. The non-cancer acute HI must be provided for the offsite point of maximum impact (PMI). Additionally, cancer risk and hazard index values at each sensitive receptor located within the zone of impact must be presented in a table. The zone of impact is discussed in the next section.

3.8. Zone of Impact

In any risk assessment, it is necessary to define a zone of impact or a method to set boundaries on the analysis. For AB2588 purposes, the SCAQMD requires that the risk assessment must encompass the area subject to an added lifetime cancer risk (all pathways) of one in one million or greater ($\geq 1.0 \times 10^{-6}$). For non-carcinogens the analysis must bound the area subject to a hazard index of greater than or equal to one half (≥ 0.5).

3.9. Land Use Considerations

Risk estimates are sensitive to land uses (e.g. residential, commercial, vacant) since these factors can affect exposure assumptions. If residential or worker risks are not calculated at the point of maximum impact because the land is currently vacant, the location, zoning and potential future land uses must be discussed. Updated information on current land uses is requested when updated emission estimates are reported to the SCAQMD.

3.10. Maps

Maps showing the location of the source in relation to the zone of impact must be submitted. Dispersion modeling for sources should be conducted with receptors defined in terms of Universal Transverse Mercator (UTM) coordinates. For carcinogen impacts, total risk isopleths for facilities should be plotted on the street map provided through HARP2 at cancer risk intervals of 1, 10, 25, and 100 in a million. Isopleths for non-carcinogens must include levels corresponding to a HI of 0.5, 1, 3, and 5.

Separate maps should be provided for each of the three risk variables: cancer risks, non-cancer acute risks, and non-cancer chronic risks. The maps must contain an accurate scale for measuring distances and a legend. The map scale that can accommodate the isopleths and show the greatest level of detail must be used. The names of streets and other locations must be presented and be legible.

The location of schools, hospitals, day-care centers, other sensitive receptors, residential areas and work-sites within the zone of impact must be identified on the map. If the area of the zone of impact is very large, then more detail should be devoted to higher concentration/risk areas versus lower risk areas. The land uses in the vicinity of the point of maximum impact (off-site) must be shown in detail. This may require a separate map. If sensitive receptors are located within the zone of impact, then risk and hazard index values must also be presented in the form of a table including all the sensitive receptors.

3.11. Air Dispersion Modeling

Air dispersion modeling is performed for the exposure assessment of the health risk assessment. A basic understanding of dispersion modeling is presumed. For a more detailed overview of regulatory modeling procedures, the reader is referred to the U.S. Environmental Protection Agency's "Guideline on Air Quality Models"[12] and/or the OEHHA guidelines.

3.11.1. Facility Description and Source Information

The HRA report should contain a brief description of the facility and its activities as shown in the detailed HRA report outline provided in Appendix C. Table 6 lists the information on the facility and its surroundings that must be provided in the modeling analysis. The facility location is used to determine the most representative meteorological data for the analysis. The nearby land use is needed to properly label receptors as residential, commercial, sensitive, etc.

The facility plot plan (including a length scale) is needed to determine all source locations including their elevations above sea level, building dimensions, and the property boundary. The operating schedule, the hourly emission rates, the annual average emission rates, and the source parameters listed in Table 6 are necessary to accurately characterize the source emissions. The reader is referred to the detailed outline provided in Appendix C for additional information and guidance.

[12] http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf

Table 5. Required Source Information.

<u>Information on the Facility and Its Surroundings</u> • Location (i.e., address and UTM coordinates in WGS84) • Local land use (within 20 km) • Local topography (within 20 km) • Facility plot plan – Property boundaries – Horizontal scale – Building heights (for building downwash calculations) – Source locations including elevations
<u>Point Source Information (stacks, vents, etc.)</u> • Maximum and average hourly emission rates • Annual emissions • Stack location (in UTM coordinates in WGS84) on plot plan including elevation • Stack height • Stack gas exit velocity • Stack gas exit temperature • Building dimensions, heights, and location
<u>Fugitive Source Information (area and volume sources)</u> • Maximum and average hourly emission rates • Annual emissions • Source location (in UTM coordinates in WGS84) on plot plan including elevations • Source height • Area or volume dimensions

3.11.2. Model Selection and Model Options

All AB2588 risk assessments prepared for the SCAQMD must use the most recent version of Hotspots Analysis and Reporting Program (currently HARP2).[13][7] The U.S. Environmental Protection Agency (U.S. EPA) air quality dispersion model, called AERMOD is used by HARP2 for the exposure assessment. AERMOD is a Gaussian plume model capable of estimating pollutant concentrations from a wide variety of sources that are typically present in an industrial source complex. Emission sources are categorized into four basic types: point, area, volume, and open pit sources. AERMOD estimates hourly concentrations for each source/receptor pair and calculates concentrations for user-specified averaging times, including an average concentration for the complete simulation period. AERMOD includes atmospheric dispersion options for both urban and rural environments and can address flat, gently rolling, and complex terrain situations. AERMOD documentation is available on the U.S. EPA website.[14] Table 7 summarizes the dispersion modeling assumptions required by the SCAQMD. AERMOD-ready meteorological data are available on the SCAQMD website.

[13] http://www.arb.ca.gov/toxics/harp/harp.htm
[14] http://www.epa.gov/scram001/dispersion_prefrec.htm

Table 6. Summary of SCAQMD Dispersion Modeling Guidance

Parameter	Assumption
Model Control Options	
• Use Regulatory Default?	Yes
• Urban or Rural?	Urban
Source Options	
• Include Building Downwash?	Yes
Meteorology Options	
• Meteorological Data	AERMOD-ready data available on SCAQMD website. See section 3.11.3.

AERMOD should be executed using the urban dispersion parameters (i.e., URBAN), which is SCAQMD policy for all air quality impact analyses in its jurisdiction. The U.S. EPA regulatory defaults options should be implemented for all projects.

3.11.3. Meteorological Data

The SCAQMD has AERMOD-ready meteorological data from 27 stations in the South Coast Air Basin, as shown in Figures 2 and 3, and listed in Tables 8 and 9.

This data is in a format which can be directly read by U.S. EPA's dispersion model, AERMOD and by ARB's health risk assessment tool, HARP2. The nearest representative meteorological station should be chosen for modeling. Usually this is simply the nearest station; however, an intervening terrain feature may dictate the use of an alternate station. Modelers should contact the AB2588 Section regarding the most representative meteorological station if necessary. The data are available on the following SCAQMD website.[15]

[15] http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/aermod-table-1

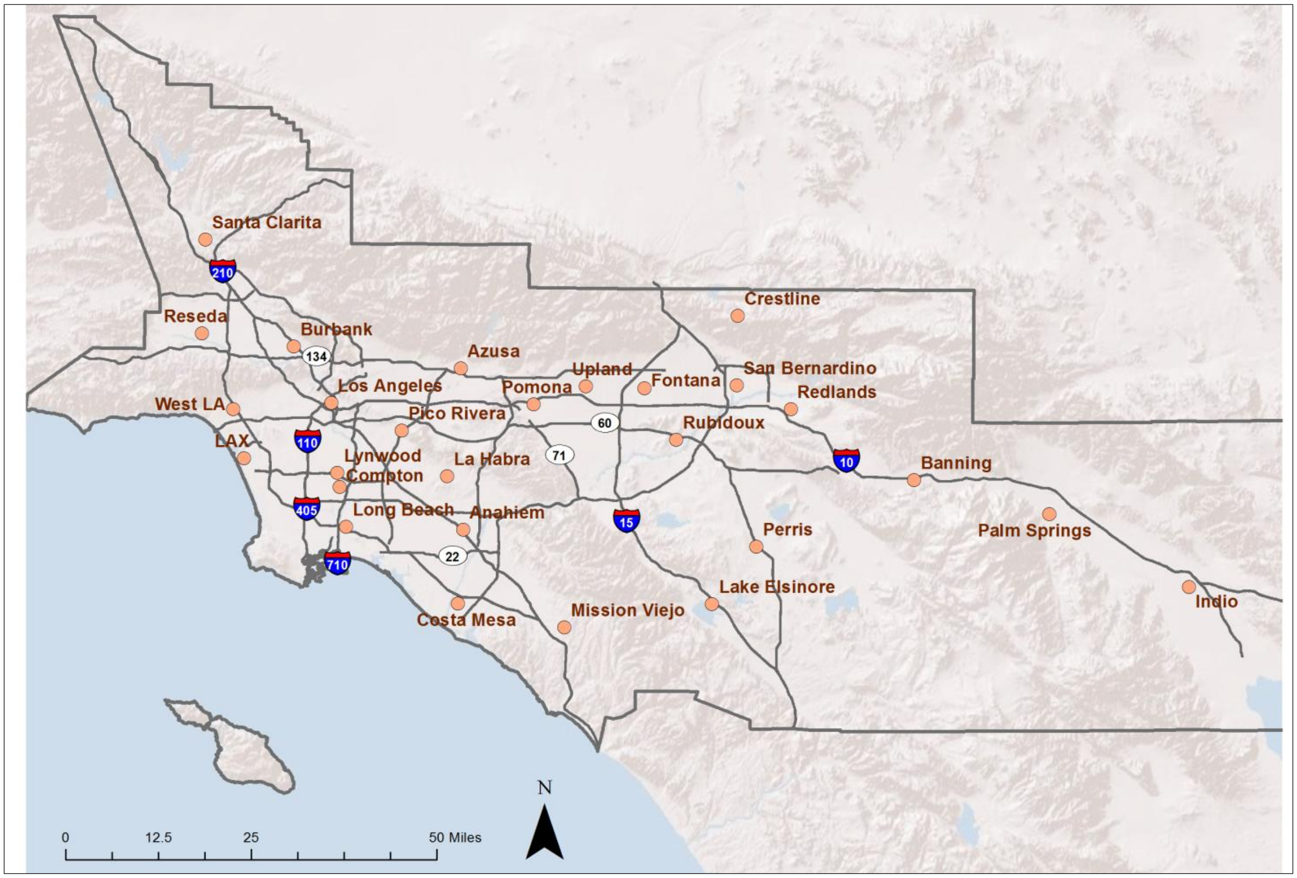


Figure 2. Locations of Meteorological Stations with AERMOD-ready data in the South Coast Air Quality Management District

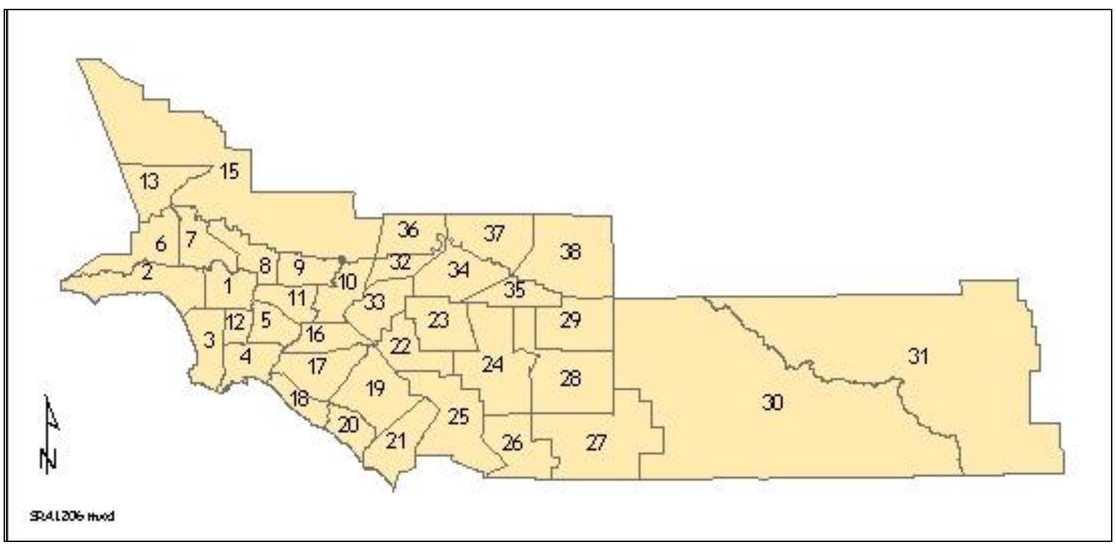


Figure 3. Source Receptor Areas (SRAs) in the South Coast Air Quality Management District. Refer to Table 9 to find the appropriate meteorological station to use for each SRA.

Table 7. Locations of Meteorological Stations

Station	Latitude/Longitude		UTM Coordinates	
	Latitude	Longitude	East (km)	North (km)
Anaheim	33:49:50	117:56:19	413.14	3743.57
Azusa	34:08:11	117:55:26	414.81	3777.47
Banning Airport	33:55:15	116:51:30	513.10	3753.19
Burbank	34:10:33	118:19:01	378.62	3782.24
Central LA	34:03:59	118:13:36	386.79	3770.00
Compton	33:54:05	118:12:18	388.59	3751.88
Costa Mesa	33:40:26	117:55:33	414.16	3726.19
Crestline	34:14:29	117:16:32	474.62	3788.76
Fontana	34:06:01	117:29:31	454.62	3773.19
Indio	33:42:30	116:12:57	572.67	3729.90
La Habra	33:55:31	117:57:08	411.98	3754.08
Lake Elsinore	33:40:35	117:19:51	469.33	3726.13
LAX	33:57:15	118:25:49	367.83	3757.80
Long Beach	33:49:25	118:11:19	389.99	3743.04
Lynnwood	33:55:44	118:12:39	388.07	3754.73
Mission Viejo	33:37:49	117:40:30	437.39	3721.17
Palm Springs	33:51:10	116:32:28	542.46	3745.73
Perris	33:47:20	117:13:40	478.91	3738.58
Pico Rivera	34:00:37	118:04:07	401.31	3763.61
Pomona	34:04:00	117:45:00	430.78	3769.61
Redlands	34:03:32	117:08:52	486.36	3768.50
Reseda	34:11:57	118:31:58	358.76	3785.11
Riverside	34:00:02	117:24:55	461.64	3762.10
San Bernardino	34:06:24	117:16:25	474.76	3773.82
Santa Clarita	34:23:00	118:31:42	359.48	3805.52
Upland	34:06:14	117:37:45	441.96	3773.66
West LA	34:03:02	118:27:24	365.54	3768.52

Table 8. Meteorological Stations for Each Source Receptor Area

Meteorological Station	Source/ Receptor Area	Meteorological Station	Source/ Receptor Area
Anaheim	17	Compton/Lynwood	12
Azusa	8, 9	Mission Viejo	19, 21
Banning	29	Perris	24, 28
Burbank	7	Palm Springs	30, 31
Central LA	1	Pico Rivera	5, 11
Crestline	37	Pomona	10
Costa Mesa	18, 20	Redlands	35, 38
Fontana	34	Reseda	6
Indio	30	Riverside	22, 23
La Habra	16	Santa Clarita	13, 15
Lake Elsinore	25, 26, 27	San Bernardino	34
LAX	3	Upland	32, 33, 36
Long Beach	4	West LA	2

3.11.4. Receptor Grid

Air dispersion modeling is required to estimate (a) annual average concentrations to calculate the Maximum Individual Cancer Risk (MICR), the maximum chronic HI, the zones of impact, and excess cancer burden and (b) peak hourly concentrations to calculate the health impact from substances with acute non-cancer health effects. To achieve these goals, the receptor grid should begin at the facility fence line and extend to cover the zone of impact. In addition, the receptor grid should be fine enough to identify the points of maximum impact.

To identify the maximum impacted receptors (i.e., peak cancer risk and peak hazard indices) a grid spacing of 100 meters or less must be used. All receptors should be identified in UTM coordinates. Receptor grid points outside of the facility boundary with grid spacing of 100 meters or more must be placed so that individual grid points are placed at UTM coordinates ending in “00” (e.g., grid point UTM East 572300 and UTM North 3731000). Receptor grids with less than 100 meter spacing must include grid points at UTM coordinates ending in “00”.

Receptors on the facility boundary must be placed along the boundary following the maximum spacing requirements shown in Table 9. Sensitive receptors must be identified by exact UTM coordinates. Elevations must be provided for all receptors.

Table 9. Maximum Receptor Spacing Requirements for Fenceline Receptors.

Area of Facility	Maximum Receptor Spacing
Area < 4 acres	20 meters
4 acres ≤ Area < 10 acres	30 meters
10 acres ≤ Area < 25 acres	50 meters
25 acres ≤ Area < 100 acres	75 meters
Area ≥ 100 acres	100 meters

3.11.5. Stacks with Raincaps and Area Sources

Emission release points with raincaps or which are oriented so that the exhaust is vented downward or horizontally may not use the velocity inside the stack as the vertical velocity of the point source in the model. However, as a point source must be modeled with some vertical velocity, these stacks may be modeled with a positive vertical velocity of no more than 0.01 meters per second. In general, if there is uncertainty on how to represent sources in a model, SCAQMD staff in the AB2588 Section should be consulted before proceeding with modeling.

According to U.S. EPA guidance for area sources in AERMOD, the aspect ratio (i.e., length/width for area sources should be less than 10 to 1. If this is exceeded, then the area should be subdivided to achieve a 10 to 1 or less aspect ratio for all sub-areas.

3.12. Risk Assessment

The SCAQMD requires that all AB2588 HRAs be prepared in accordance with OEHHA and ARB guidance[16] and using the ARB computer program: HotSpots Analysis and Reporting Program (HARP2), or the latest approved version of the program. OEHHA guidance requires at least a Tier-1 evaluation, which allows for Derived Risk Calculations. The Derived method uses high end exposure parameters for the top two exposure pathways and mean exposure parameters for the remaining pathways for cancer risk estimates. For chronic non-cancer assessments, the Derived method uses high end exposures for the top three exposure pathways. ARB is developing an updated Risk Management Policy that includes recommendations for inhalation exposures.[17] Preliminary discussions have indicated that they will recommend using high end breathing rates (95th percentile) for children from the 3rd trimester through age 2, and 80th percentile breathing rates for all other ages for residential exposures. In accord with these guidelines, OEHHA and SCAQMD will allow Derived Risk Calculations using ARB's Risk Management Policy to be prepared and presented in an AB2588 HRA. ARB prepared HARP2 to facilitate the preparation and transmittal of a compliant ATIR and HRA. The details are provided below.

[16] http://oehha.ca.gov/air/hot_spots/hotspots2015.html
[17] Information regarding ARB's Risk Management policy can be located at: http://www.arb.ca.gov/toxics/toxics.htm

3.12.1. OEHHA Guidance

OEHHA guidance is contained in the Air Toxics Hot Spots Program Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments (OEHHA February 2015). This guidance manual has undergone public and peer review, was endorsed by the California Scientific Review Panel (SRP), and approved by OEHHA. The guidance manual is available from the web.[18]

OEHHA Guidance recognizes four types of evaluations.

Tier-1: point estimate, using standard assumptions

Tier-2: point estimate, using site-specific details

Tier-3: stochastic risk, using standard assumptions

Tier-4: stochastic risk, using site-specific details

The details are described in the Guidance Manual.

"Tier-1 is a standard point-estimate approach using the recommended point-estimates presented in this document. […] Tier-1 evaluations are required for all HRAs prepared for the Hot Spots Program." (see Section 2.5.3. of reference [1]; boldface added)

"[T]he Tier-1 evaluation is useful in comparing risks among a large number of facilities and must be included in all HRAs." (see Section 8.2.5.C. of reference [1]; boldface added)

As such, the SCAQMD requires that all AB 2588 HRAs contain at least a Tier-1 evaluation. The results of the Tier-1 evaluation are used for comparative and regulatory purposes (i.e., risk status, fee category, public notice, and risk reduction).

The Executive Summary and main body of the HRA shall contain only statements regarding the results of the Tier-1 evaluation. Tier-2, Tier-3, and Tier-4 evaluations may be prepared and presented as an appendix to the main document. The results of the Tiers 2-4 evaluations should not be in the Executive Summary and main document. Site specific details for either a Tier-2 or Tier-4 evaluation may require review and approval by OEHHA, ARB, or SCAQMD.

3.12.3. HARP2

To facilitate the preparation and submittal of ATIRs and HRAs, CARB prepared and distributes HARP2 for free. The program and documentation are available from the web.[19]

HARP2 is "designed to meet the programmatic requirements of the Hot Spots Program." (page 10-1 of reference 7). HARP2 will calculate all four OEHHA Tiers and both the Derived Risk Calculations (as designed by OEHHA) and ARB's Risk Management Policy Inhalation Rates for Residential Cancer Risk Calculations.

The outline for an HRA is contained in Appendix C. The list of files that must be submitted with an AB2588 HRA are included in Table 10 below. Any emissions factor development, emission

[18] http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[19] http://www.arb.ca.gov/toxics/harp/harp.htm

rates calculations, or approved source test protocol and reports must be submitted in electronic format (e.g., in Microsoft Excel) along with the facility CD. If these items have been attached to Annual Emissions Report (AER), you may refer to it in the cover letter and avoid a redundant submittal.

Table 10. Files that must be provided with HRA submittals

File Type	Notes
HRA Input	All files created by ARB's ADMRT
HRA Output	
Dispersion Modeling Input	All AERMOD and BPIP files used in the HRA including terrain data. All meteorological data files including any AERMET files if default SCAQMD meteorological data is not used.
Dispersion Modeling Output	
Emission Inventory Input	All files created by ARB's EIM
Emission Inventory Output	
Emission Calculations	Provided in electronic format (e.g., Excel) and documented references
Source Tests	Source tests can only be used if approved by SCAQMD staff
Air Monitoring Data	Any monitoring data used in the HRA should be provided.

3.12.4. SCAQMD Health Risk Assessment Guidance

All HRAs prepared for the SCAQMD must include an OEHHA Tier-1 evaluation. All SCAQMD risk management decisions are based on the Tier-1 risk assessment. Tier-2, Tier-3, and Tier-4 evaluations may be prepared but must be included in an appendix of the HRA. The results of the Tier-2, Tier-3, and/or Tier-4 evaluations must not be included in the Executive Summary or main body of the HRA. Table 11 summarizes the risk assumptions required by the SCAQMD. Deviations from these defaults must be approved by SCAQMD staff prior to their use. These requirements are discussed in more detail next.

Residential cancer risks assume a 30-year exposure (cancer burden assumes a 70-year exposure) and must include, at a minimum, the following pathways: home grown produce, dermal absorption, soil ingestion, and mother's milk. A deposition velocity of 0.02 m/s should be assumed for the non-inhalation pathways. The HRA should assume default values in HARP2 for all pathways with the exception of the dermal pathway which should assume a 'warm' climate. The other pathways of fish ingestion; dairy milk ingestion; drinking water consumption; and meat (i.e., beef, pork, chicken, and egg) ingestion should be included only if the facility impacts a local fishable body of water, grazing land, dairy, or water reservoir. The "RMP Using the Derived Method" risk calculation option should be used for estimating cancer risks at residential receptors. To estimate chronic non-cancer risks at residential receptors the "OEHHA Derived Method" risk calculation option should be used. The 8-hour chronic non-cancer risk should also be calculated for residential receptors for any source that operates at least 8 hours per day and 5 days per week.

Table 11. Summary of SCAQMD Health Risk Assessment Guidance.

Parameter	**Assumptions**
Multi-Pathway	
• Inhalation	Required for residential & worker receptors
• Dermal	Required for residential & worker receptors
• Soil	Required for residential & worker receptors
• Homegrown Produce	Required for residential receptors
• Mother's Milk	Required for residential receptors
• Beef/Dairy	Site specific; see note #1 below
• Pigs, chickens, and/or eggs	Site specific; see note #1 below
• Deposition Velocity	0.02 meters per second
• MP Exposure Assumptions	Use HARP2 defaults except for dermal pathway which uses 'warm' climate
Residential Cancer Risk Assumptions	
• Exposure Duration	30 years for individual receptors 70 years for cancer burden
• Analysis Option	RMP Using the Derived Method
Worker Cancer Risk Assumptions	
• Exposure Duration	25 years
• Analysis Option	OEHHA Derived Method
Residential and Worker Non-Cancer Risk Assumptions	
• Analysis Option	OEHHA Derived Method

Worker cancer risks assume a 25-year exposure and must include the pathways of dermal absorption and soil ingestion. A deposition velocity of 0.02 m/s should be assumed for these pathways and the dermal pathway should assume a 'warm' climate. The "OEHHA Derived Method" risk calculation option should be used for estimating cancer and non-cancer chronic risks at worker receptors.

The air concentration that the neighboring workers breathe when present at work is different than the annual average concentration calculated by the dispersion model, AERMOD. The annual average estimated by the dispersion model is a 24 hours per day, 7 days per week, 365 days per year average, regardless of the actual operating schedule of the emitting facility. It is assumed the off-site worker is impacted by the toxic emissions only during work hours. Thus, the model-predicted concentrations must be adjusted by a multiplying factor to reflect the pollutant concentration that the worker breathes. For example, suppose that the off-site worker and the emitting facility have the same operating schedule, perhaps 8 hours per day, 5 days per week, and 52 weeks per year. The annual average concentrations predicted by AERMOD must be adjusted by a factor of 4.2 (i.e., 7/5 x 24/8). The reader is referred to the OEHHA guidelines for further detail on this issue.

The adjustment factors for all possible operating schedules are given in Table 12. These factors are entered into HARP2 by activating the WAF option in the Inhalation Pathway and entering the appropriate factor from Table 12.

The adjustments in Table 12 should only be applied when estimating worker cancer risks for facilities that do not operate continuously. The adjustments are not applicable to residential cancer risks and to residential and worker chronic non-cancer risks.

Table 12. Adjustment Factors for Off-site Worker Ground-level Concentrations.*

Hours of Operation per Day	Days of Operation per Week		
	1 to 5	6	7
1 to 8	4.2	3.5	3.0
9	3.7	3.1	2.7
10	3.4	2.8	2.4
11	3.1	2.5	2.2
12	2.8	2.3	2.0
13	2.6	2.2	1.8
14	2.4	2.0	1.7
15	2.2	1.9	1.6
16	2.1	1.8	1.5
17	2.0	1.6	1.4
18	1.9	1.6	1.3
19	1.8	1.5	1.3
20	1.7	1.4	1.2
21	1.6	1.3	1.1
22	1.5	1.3	1.1
23	1.5	1.2	1.0
24	1.4	1.2	1.0

* These adjustment factors should only be used when calculating worker cancer risks. The adjustment factors should not be used when calculating chronic non-cancer risks.

Appendix A AB2588
List of Toxics

Table A-1 contains the list of compounds to be reported by AB2588 facilities preparing their quadrennial emissions inventory under the AER Program. The table provides the compound name, its TAC code and CAS number, and the degree of accuracy for each toxic. The table is alphabetically sorted by name. Multiple compounds within a TAC code group are listed in alphabetical order and shown in italics. The degree of accuracy is nothing more than a de minimis emission level for reporting. As a result, facility-wide emissions of toxics greater than one-half of their corresponding degree of accuracy must be inventoried and reported. Conversely, total facility toxic emissions less than one-half of the degree of accuracy do not need to be reported for TAC Codes 24 through 73. The degree of accuracy in the Draft version of this document provides the values listed in the Emission Inventory Criteria and Guidelines for the Air Toxics "Hot Spots" Program developed by CARB dated September 26, 2007. To be consistent with the updated risk assessment methodologies pursuant to OEHHA's 2015 update, SCAQMD has revised the degree of accuracy reporting thresholds in Table A-1.

Table A-1 lists the family name and the individual species within the family for the following toxic air contaminants (TACs):

- Chlorinated dioxins and dibenzofurans (TAC code #7)
- Fluorocarbons (chlorinated) (TAC code #22)
- Glycol ethers and their acetates (TAC code #41)
- Hexachlorocyclohexanes (TAC code #43)
- Isocyanates and diisocyanates (TAC code #48)
- Mercury and mercury compounds (TAC code #50)
- PAHs (TAC code #19)
- Phosphorous compounds (TAC code #60)
- POMS and PAH-derivatives (TAC code #61)
- Selenium and compounds (TAC code #64)
- Sulfuric acid and oleum (TAC code #67)
- Xylenes (TAC code #70)

Table A-1. DeMinimis Reporting Limits for Toxics.

TAC Code	CAS Number	Substance	Degree of Accuracy (lbs/yr)
29	75070	Acetaldehyde	17~~20~~
30	107028	Acrolein	0.05
31	107131	Acrylonitrile	0.1
32	7664417	Ammonia	200
14	7440382	Arsenic and Compounds (inorganic)	~~0.01~~0.0015
1	1332214	Asbestos	~~0.0001~~2.3E-6
2	71432	Benzene	~~2~~1.7
3	7440417	Beryllium	0.001
4	106990	Butadiene [1,3]	0.1
5	7440439	Cadmium	0.01
6	56235	Carbon tetrachloride	1
33	463581	Carbonyl sulfide	100
34	7782505	Chlorine	0.5
35	67663	Chloroform	~~10~~9
13	18540299	Chromium, hexavalent (and compounds)	1E-4~~0.0001~~
36	7440508	Copper	0.1
37	7631869	Crystalline silica	0.1
38	117817	Di(2-ethylhexyl) phthalate {DEHP}	3.9~~20~~
7	1080	Chlorinated dioxins and dibenzofurans	~~0.000001~~7.3E-8
	67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran [POM]	1E-6~~0.000001~~
	55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran [POM]	1E-6~~0.000001~~
	35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin [POM]	1E-6~~0.000001~~
	70648269	1,2,3,4,7,8-Hexachlorodibenzofuran [POM]	7.3E-7~~0.000001~~
	57117449	1,2,3,6,7,8-Hexachlorodibenzofuran [POM]	7.3E-7~~0.000001~~
	72918219	1,2,3,7,8,9-Hexachlorodibenzofuran [POM]	7.3E-7~~0.000001~~
	60851345	2,3,4,6,7,8-Hexachlorodibenzofuran [POM]	7.3E-7~~0.000001~~
	39227286	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin [POM]	5.1E-7~~0.000001~~
	57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin [POM]	5.1E-7~~0.000001~~
	19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin [POM]	5.1E-7~~0.000001~~
	39001020	1,2,3,4,5,6,7,8-Octachlorodibenzofuran [POM]	~~0.000001~~1E-6
	3268879	1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin [POM]	1E-6~~0.000001~~
	57117416	1,2,3,7,8-Pentachlorodibenzofuran [POM]	1E-6~~0.000001~~
	57117314	2,3,4,7,8-Pentachlorodibenzofuran [POM]	2.4E-7~~0.000001~~
	40321764	1,2,3,7,8-Pentachlorodibenzo-p-dioxin [POM]	5.1E-8~~0.000001~~
	51207319	2,3,7,8-Tetrachlorodibenzofuran [POM]	7.2E-7~~0.000001~~
	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin {TCDD} [POM]	5.1E-8~~0.000001~~
27	78875	1,2-Dichloropropane {Propylene dichloride}	20
28	542756	1,3-Dichloropropene	10
72	9901	Diesel exhaust particulates	0.1
39	131113	Dimethyl phthalate	50
8	123911	1,4-Dioxane	5
40	100414	Ethyl benzene	20~~200~~
9	106934	Ethylene dibromide {1,2-Dibromoethane}	0.5
10	107062	Ethylene dichloride {1,2-Dichloroethane}	2
11	75218	Ethylene oxide	0.5

(continued)
Table A-1. (continued)

TAC Code	CAS Number	Substance	Degree of Accuracy (lbs/yr)
22	1104	Fluorocarbons (chlorinated)	1
	76131	Trichlorotrifluoroethane {CFC-113}	1
	75434	Dichlorofluoromethane {Freon 21}	1
	75694	Trichlorofluoromethane {Freon 11}	1
12	50000	Formaldehyde	5
41	1115	Glycol ethers and their acetates	100
	111466	Diethylene glycol	100
	111966	Diethylene glycol dimethyl ether	100
	112345	Diethylene glycol monobutyl ether	100
	111900	Diethylene glycol monoethyl ether	100
	111773	Diethylene glycol monomethyl ether	100
	25265718	Dipropylene glycol	100
	34590948	Dipropylene glycol monomethyl ether	100
	629141	Ethylene glycol diethyl ether	100
	110714	Ethylene glycol dimethyl ether	100
	111762	Ethylene glycol monobutyl ether	200
	110805	Ethylene glycol monoethyl ether	50
	111159	Ethylene glycol monoethyl ether acetate	100
	109864	Ethylene glycol monomethyl ether	10
	110496	Ethylene glycol monomethyl ether acetate	200
	2807309	Ethylene glycol monopropyl ether	100
	107982	Propylene glycol monomethyl ether	200
	108656	Propylene glycol monomethyl ether acetate	100
	112492	Triethylene glycol dimethyl ether	100
42	118741	Hexachlorobenzene	0.096~~0.1~~
43	608731	Hexachlorocyclohexanes	0.008~~0.05~~
	319846	alpha-Hexachlorocyclohexane	0.008~~0.1~~
	319857	beta-Hexachlorocyclohexane	0.008~~0.1~~
	58899	Lindane {gamma-Hexachlorocyclohexane}	0.03~~0.1~~
44	110543	Hexane	200
45	302012	Hydrazine	0.01
46	7647010	Hydrochloric acid	20
73	7664393	Hydrogen fluoride (hydrofluoric acid)	~~50~~20
47	7783064	Hydrogen sulfide	5
48	1125	Isocyanates and diisocyanates	0.05
	822060	Hexamethylene-1,6-diisocyanate	0.05
	624839	Methyl isocyanate	1
	101688	Methylene diphenyl diisocyanate {MDI} [POM]	0.1
	1204	Toluene diisocyanates	0.1
	584849	Toluene-2,4-diisocyanate	0.1
	91087	Toluene-2,6-diisocyanate	0.1
15	7439921	Lead compounds (inorganic)	0.36~~0.5~~
49	7439965	Manganese	0.1

(continued)

Table A-1. (continued)

TAC Code	CAS Number	Substance	Degree of Accuracy (lbs/yr)
50		Mercury and mercury compounds	
	7487947	Mercuric chloride	~~1~~0.9
	7439976	Mercury	~~1~~0.9
	593748	Methyl mercury {Dimethylmercury}	1
51	67561	Methanol	200
52	74873	Methyl chloride {Chloromethane}	20
23	71556	Methyl chloroform {1,1,1-Trichloroethane}	1
53	78933	Methyl ethyl ketone {2-Butanone}	200
54	108101	Methyl isobutyl ketone {Hexone}	20
55	1634044	Methyl tert-butyl ether	96~~200~~
16	75092	Methylene chloride {Dichloromethane}	~~50~~49.1
17	7440020	Nickel	0.1
57	106467	p-Dichlorobenzene {1,4-Dichlorobenzene}	4.3~~5~~
19	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.2
	83329	Acenaphthene [PAH, POM]	1
	208968	Acenaphthylene [PAH, POM]	1
	120127	Anthracene [PAH, POM]	1
	56553	Benz[a]anthracene [PAH, POM]	0.02~~0.5~~
	50328	Benzo[a]pyrene [PAH, POM]	0.002~~0.05~~
	205992	Benzo[b]fluoranthene [PAH, POM]	0.02~~0.5~~
	192972	Benzo[e]pyrene [PAH, POM]	0.5
	191242	Benzo[g,h,i]perylene [PAH, POM]	0.5
	205823	Benzo[j]fluoranthene [PAH, POM]	0.02~~0.5~~
	207089	Benzo[k]fluoranthene [PAH, POM]	0.02~~0.5~~
	218019	Chrysene [PAH, POM]	0.2~~1~~
	53703	Dibenz[a,h]anthracene [PAH, POM]	0.005~~0.1~~
	192654	Dibenzo[a,e]pyrene [PAH, POM]	0.002~~0.05~~
	189640	Dibenzo[a,h]pyrene [PAH, POM]	0.0002~~0.001~~
	189559	Dibenzo[a,i]pyrene [PAH, POM]	0.0002~~0.001~~
	191300	Dibenzo[a,l]pyrene [PAH, POM]	0.0002~~0.001~~
	206440	Fluoranthene [PAH, POM]	0.5
	86737	Fluorene [PAH, POM]	0.5
	193395	Indeno[1,2,3-cd]pyrene [PAH, POM]	0.02~~0.5~~
	91576	2-Methyl naphthalene [PAH, POM]	1
	91203	Naphthalene [PAH, POM]	0.1
	198550	Perylene [PAH, POM]	0.5
	85018	Phenanthrene [PAH, POM]	0.5
	129000	Pyrene [PAH, POM]	0.5
56	1336363	PCBs (Polychlorinated biphenyls) [POM]	0.0002~~0.01~~
58	87865	Pentachlorophenol	9.6~~10~~
18	127184	Perchloroethylene {Tetrachloroethene}	5
59	7723140	Phosphorus	0.1

(continued)
Table A-1. (continued)

TAC Code	CAS Number	Substance	Degree of Accuracy (lbs/yr)
60		Phosphorous compounds	
	7803512	Phosphine	0.01
	7664382	Phosphoric acid	50
	10025873	Phosphorus oxychloride	0.1
	10026138	Phosphorus pentachloride	0.1
	1314563	Phosphorus pentoxide	0.1
	7719122	Phosphorus trichloride	0.1
	126738	Tributyl phosphate	100
	78400	Triethyl phosphine Trimethyl	100
	512561	phosphate Triorthocresyl	100
	78308	phosphate [POM] Triphenyl	0.5
	115866	phosphate [POM] Triphenyl	100
	101020	phosphite [POM]	100
61		POMS and PAH-derivatives	
	226368	Dibenz[a,h]acridine [POM]	0.02~~0.5~~
	224420	Dibenz[a,j]acridine [POM]	0.02~~0.5~~
	194592	7H-Dibenzo[c,g]carbazole	0.002~~0.05~~
	57976	7,12-Dimethylbenz[a]anthracene [PAH-Derivative, POM]	9E-5~~0.0001~~
	42397648	1,6-Dinitropyrene [PAH-Derivative, POM]	2E-4~~0.001~~
	42397659	1,8-Dinitropyrene [PAH-Derivative, POM]	0.002~~0.05~~
	56495	3-Methylcholanthrene [PAH-Derivative, POM]	9.8E-4~~0.001~~
	3697243	5-Methylchrysene [PAH-Derivative, POM]	0.002~~0.05~~
	101779	4,4'-Methylenedianiline (and its dichloride) [POM]	0.015~~0.1~~
	602879	5-Nitroacenaphthene [POM]	0.17~~1~~
	7496028	6-Nitrochrysene [PAH-Derivative, POM]	2E-4~~0.00020.001~~
	607578	2-Nitrofluorene [PAH-Derivative, POM]	0.2~~5~~
	5522430	1-Nitropyrene [PAH-Derivative, POM]	0.02~~0.5~~
	57835924	4-Nitropyrene [POM]	0.02~~1~~
62	75569	Propylene oxide	10
63	91225	Quinoline	100
64		Selenium and compounds	
	7783075	Hydrogen selenide	0.1
	7782492	Selenium	0.5
	7446346	Selenium sulfide	0.1
65	1310732	Sodium hydroxide	2
66	100425	Styrene	100
24	79345	1,1,2,2-Tetrachloroethane	0.86~~1~~
67		Sulfuric acid and oleum	
	8014957	Oleum	2~~100~~
	7664939	Sulfuric acid	2
	7446719	Sulfur trioxide	2~~100~~
68	108883	Toluene	200
25	79005	1,1,2-Trichloroethane {Vinyl trichloride}	~~1~~3
20	79016	Trichloroethylene	20
26	95636	1,2,4-Trimethylbenzene	5

(continued)

Table A-1. (concluded)

TAC Code	CAS Number	Substance	Degree of Accuracy (lbs/yr)
69	51796	Urethane {Ethyl carbamate}	0.1
21	75014	Vinyl chloride	0.5
70	1330207	Xylenes	200
	108383	m-Xylene	200
	95476	o-Xylene	200
	106423	p-Xylene	200
71	75456	Chlorodifluoromethane {Freon 22}	200

Appendix B

Elements of Air Toxics Inventory Report

1. Report Summary (hard copy)

- Facility name, ID, and location
- Facility plot plan identifying: emission source location, property line, horizontal scale, building heights and dimensions
- Facility total emission rate by substance for all emittants including the following information (OEHHA Guidelines Appendix A-I Substances must be quantified in the inventory report):
  - substance name and CAS number
  - annual average emission for each substance (lb/yr & g/s)
  - maximum one-hour emissions for each substance (lbs/hr & g/s)
- Supporting documentation such as source test report and approval letter if emissions are measured

2. Use the EIM software from HARP2 to provide facility, device, process, emissions, and stack data in a HARP2 database, including but not limited to the following information:

- Source identification number used by the facility
- Source name
- SCAQMD permit number, if available
- Source location using UTM coordinates (in meters) be sure to use a WGS84 projection
- Source base elevation (m)
- Source height (m)
- Source dimensions (e.g., stack diameter, building dimensions, area/volume size, etc.) (m)
- Stack gas exit velocity (m/s) if applicable
- Stack gas volumetric flow rate (ACFM) if applicable
- Stack gas exit temperature (K)
- Number of operating hours per day
- Number of operating days per week
- Number of operating weeks per year
- Report emission control equipment and efficiency by source and by substance.
  The description should be brief.
- Report annual average and maximum hourly emission rates for each toxic substance for each source
- Report emission inventory methods indicating whether emissions are measured or estimated

Appendix C

Outline for the Health Risk Assessment Report

I. Table of Contents

- Section headings with page numbers indicated.
- Tables and figures with page numbers indicated.
- Definitions and abbreviations. Must include a definition of acute, 8-hour chronic, chronic, and cancer health impacts.
- Appendices with page numbers indicated.

II. Executive Summary

- Name of facility and the complete address.
- Facility ID number
- Description of facility operations and a list identifying emitted substances, including a table of maximum 1-hour and annual emissions in units of lbs/hr and lbs/yr, respectively.
- List the multipathway substances and their pathways.
- Text presenting overview of dispersion modeling and exposure assessment.
- Text defining dose-response assessment for cancer and noncancer health impacts and a table showing target organ systems by substance for noncancer impacts.
- Summary of results (See Attachment A to this Appendix). Potential cancer risks for residents must be based on 30- year, Tier-1 analysis and potential cancer risks for workers must be based on 25- year, Tier-1 analysis. Cancer burden results must be based on 70-year, Tier-1 analysis.
    - Location (address or UTM coordinates) and description of the off-site point of maximum impact (PMI), maximum exposed individual resident (MEIR), and maximum exposed individual worker (MEIW). See Attachment A for the required summary form.
    - Location (address or UTM coordinates) and description of any sensitive receptors that are above a cancer risk of ten in one million or above a noncancer health hazard index of one.
    - Text presenting an overview of the total potential multipathway cancer risk at the PMI, MEIR, MEIW, and sensitive receptors (if applicable). Provide a table of cancer risk by substance for the MEIR and MEIW. Include a statement indicating which of the substances appear to contribute to (i.e., drive) the potential health impacts. In addition, identify the exposure pathways evaluated in the HRA.
    - Provide a map of the facility and surroundings and identify the location of the MEIR, MEIW, and PMI.
    - Provide a map of 30-year lifetime cancer risk zone of impact (i.e., 1 in one million risk contour), if applicable. Also show the 10, 25, and 100 in one million risk contours, if applicable. If the cancer burden is greater than 0.5, then a map showing the 1 in one million risk contour based on a 70-year

lifetime should also be presented.

- Text presenting an overview of the acute and chronic noncancer hazard quotients or the (total) hazard indices for the PMI, MEIR, MEIW, and sensitive receptors. Include separate statements (for acute, 8-hour chronic, and annual chronic exposures) indicating which of the substances appear to drive the potential health impacts. In addition, clearly identify the primary target organ(s) that are impacted from acute and chronic exposures.
- Identify any subpopulations (e.g., subsistence fishers) of concern.
- Table and text presenting an overview of estimates of population exposure.
- Version of the Risk Assessment Guidelines and computer program(s) used to prepare the risk assessment.

III. Main Body of Report

A. Hazard Identification

- Table and text identifying all substances emitted from the facility. Include the CAS number of substance and the physical form of the substance if possible. The complete list of the substances to be considered is contained in Appendix A of The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (2015).

- Table and text identifying all substances that are evaluated for cancer risk and/or noncancer acute and chronic health impacts. In addition, identify any substances that present a potential cancer risk or chronic noncancer hazard via noninhalation routes of exposure.

- Describe the types and amounts of continuous or intermittent predictable emissions from the facility that occurred during the reporting year. As required by statute, releases from a facility include spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping (fugitive), leaching, dumping, or disposing of a substance into ambient air. Include the substance(s) released and a description of the processes that resulted in long-term and continuous releases.

B. Exposure Assessment

This section describes the information related to the air dispersion modeling process that should be reported in the risk assessment. In addition, doses calculated by pathway of exposure for each substance should be included in this section. The educated reader should be able to reproduce the risk assessment without the need for clarification. The location of any information that is presented in appendices, on electronic media, or attached documents that supports information presented in this section, must be clearly identified by title and page number in this section's text and in the document's table of contents.

B.1. Facility Description

Report the following information regarding the facility and its surroundings:

- Facility name
- Facility ID
- Facility location (i.e., address)
- Local topography
- Facility plot plan identifying: emission source locations, property line, horizontal scale, building heights and dimensions
- Description of the site/route dependent exposure pathways. Provide a summary of the site-specific inputs used for each pathway (e.g., water or grazing intake assumptions). This information may be presented in the appendix with the information clearly presented and cross-referenced to the text.

B.2. Emissions Inventory

Report the following information regarding the facility's sources and emissions in table format; see Appendix K of OEHHA Guidelines (2015). Depending on the number of sources and/or pollutants, this information may be placed in the main body of the report or in an appendix.

- Source identification number used by the facility
- Source name
- Source location using UTM coordinates (in meters); be sure to use a WGS84 projection
- Source base elevation (m)
- Source height (m)
- Source dimensions (e.g., stack diameter, building dimensions, area/volume size, etc.) (m)
- Stack gas exit velocity (m/s) if applicable
- Stack gas volumetric flow rate (ACFM) if applicable
- Stack gas exit temperature (K)
- Number of operating hours per day and per year
- Number of operating days per week
- Number of operating days or weeks per year
- Report emission control equipment and efficiency by source and by substance. The description should be brief.

- Report emission inventory methods indicating whether emissions are measured or estimated
- Report emission rates for each toxic substance, grouped by source, in table form including the following information (see Appendix K of OEHHA Guidelines, 2015). Depending on the number of sources and/or pollutants, this information may be placed in the main body of the report or in an appendix.
  - Source name
  - Source identification number
  - Substance name and CAS number
  - Annual average emissions for each substance (lbs/yr & g/s). Radionuclides are reported in Curies/yr.
  - Maximum one-hour emissions for each substance (lbs/hr & g/s). Radionuclides are reported in millicuries/yr.
- Report facility total emission rates by substance for all emittants including the following information (see Appendix K of OEHHA Guidelines, 2015). This information should be in the main body of the report.
  - Substance name and CAS number
  - Annual average emissions for each substance (lbs/yr & g/s). Radionuclides are reported in Curies/yr.
  - Maximum one-hour emissions for each substance (lbs/hr & g/s). Radionuclides are reported in millicuries/yr.

B.3. Air Dispersion Modeling

- The HRA should indicate the source and time period of the meteorological data used. Include the meteorological data electronically with the HRA. The SCAQMD has AERMOD-ready meteorological data at 27 stations in the South Coast Air Basin. This data can be downloaded from the SCAQMD web site.
- Include proper justification for using the meteorological data. The nearest representative meteorological station should be chosen for modeling. Usually this is simply the nearest station to the facility; however, an intervening terrain feature may dictate the use of an alternate site.
- HARP2 <u>or the latest approved version of the program </u>should be used for all health risk assessments prepared for the AB2588
  Program. Make sure that the latest version of the program is used.
- Table and text that specifies the following information:
  - Selected model options and parameters
  - Receptor grid spacing
- For the PMI, MEIR, MEIW, and any sensitive receptors required by the SCAQMD, include tables that summarize the annual average concentrations calculated for all substances.

- For the PMI, MEIR, MEIW, and any sensitive receptors required by the SCAQMD, include tables that summarize the maximum one-hour; chronic 8-hour; and 90-day rolling average (lead only) concentrations.

C. Risk Characterization

HARP2 generates the risk characterization data needed for the outline below. Any data needed to support the risk characterization findings should be clearly presented and referenced in the text and appendices. A listing of HARP2 files that meet these HRA requirements are provided in Section DV of the main body of the AB2588 Supplemental Guidance. All HARP2 files should be included in the HRA. Ideally, the HRA report and a summary of data used in the HRA should be on paper and all data and model input and output files should be provided electronically (i.e., CD).

The potential cancer risk for the PMI, MEIR, and sensitive receptors of interest must be presented in the HRA's text, tables, and maps using a residential 30-year exposure period. MEIW location should use appropriate exposure periods. For the AB2588 Program, the 30-year exposure duration should be used as the basis for residential public notification and risk reduction audits and plans. All HRAs must include the results of a Tier-1 exposure assessment. If persons preparing the HRA would like to present additional information (i.e., exposure duration adjustments or the inclusions of risk characterizations using Tier-2 through Tier-4 exposure data), then this information should be presented in separate, clearly titled, sections, tables, and text.

The following information should be presented in this section of the HRA. If not fully presented here, then by topic, clearly identify the section(s) and pages within the HRA where this information is presented.

- Description of receptors to be quantified.
- Identify the site/route dependent exposure pathways (e.g., water ingestion) for the receptor(s), where appropriate (e.g., MEIR). Provide a summary of the site-specific inputs used for each exposure pathway (e.g., water or grazing intake assumptions). In addition, provide reference to the appendix (section and page number) that contains the modeling (i.e., HARP2/dispersion modeling) files that show the same information.
- Tables and text providing the following information regarding the potential multipathway cancer risks at the PMI, MEIR, MEIW, and any sensitive receptors of concern:
  - Location in UTM coordinates
  - Contribution by substance
  - Contribution by source
  - 9- and 70-year cancer risks
- Tables and text providing the following information regarding the acute noncancer hazard quotient at the PMI, MEIR, MEIW, and any sensitive receptors of concern:
  - Location in UTM coordinates

- Target organ(s)
- Contribution by substance
- Contribution by source

- Tables and text providing the following information regarding the chronic noncancer (inhalation and oral) hazard quotient at the PMI, MEIR, MEIW, and any sensitive receptors of concern:
  - Location in UTM coordinates
  - Target organ(s)
  - Contribution by substance
  - Contribution by source

- Table and text presenting estimates of population exposure. Tables should indicate the number of persons exposed to a total cancer risk greater than 10^{-6}, 10^{-5}, 10^{-4}, etc. and total hazard quotient or hazard index greater than 0.5, 1.0, 3.0, and 5.0. Total excess cancer burden should also be provided.

- Provide maps that illustrate the HRA results as noted below. The maps should be an actual street map of the area impacted by the facility with UTM coordinates and facility boundaries clearly labeled. This should be a true map (i.e., one that shows roads, structures, etc.), drawn to scale, and not just a schematic drawing. Color aerial photos are usually the most appropriate choice. The following maps are required:
  - Locations of the PMI, MEIR, MEIW, and sensitive receptors for the cancer and noncancer acute and chronic risks. Also show the facility emission points and property boundary.
  - Total multipathway cancer risk contours for the following risk levels: 100, 25, 10, and 1 in a million. Maps should be provided for the minimum exposure pathways (i.e., inhalation, soil ingestion, dermal exposure, and breast-milk consumption) and for all applicable exposure pathways (i.e., minimum exposure pathways plus additional site/route specific pathways). Include the facility location on the maps.
  - Noncancer acute and chronic hazard index contours for the following levels: 5.0, 3.0, 1.0 and 0.5. Include the facility location.

- The risk assessor may want to include a discussion of the strengths and weaknesses of the risk analyses and associated uncertainty directly related to the facility HRA.

- If appropriate, comment on the possible alternatives for control or remedial measures.

- If possible, identify any community concerns that influence public perception of risk.

D. References

IV. Appendices

The appendices should contain all data, sample calculations, assumptions, and all modeling and risk assessment files that are needed to reproduce the HRA results. Ideally, a summary of data used in the HRA will be on paper and all data and model input and output files will be provided electronically (e.g., CD). All appendices and the information they contain should be referenced, clearly titled, and paginated. The following are potential appendix topics unless presented elsewhere in the HRA:

- List of all receptors in the zone of impact and their associated risks.
- Emissions by source.
- Census data.
- Maps and facility plot plan.
- All calculations used to determine emissions, concentrations, and potential health impacts at the PMI, MEIR, MEIW, and sensitive receptors.
- Presentation of alternate risk assessment methods (e.g., alternate exposure durations, or Tier-2 to Tier-4 evaluations with supporting information).

V. Computer Files

The list of computer files that must be submitted on CD with the HRA are included in the table below:

File Type	Notes
HRA Input HRA Output	All files created by ARB's ADMRT
Dispersion Modeling Input Dispersion Modeling Output	All AERMOD and BPIP files used in the HRA including terrain data. All meteorological data files including any AERMET files if default SCAQMD meteorological data is not used.
Emission Inventory Input Emission Inventory Output	All files created by ARB's EIM
Emission Calculations	Provided in electronic format (e.g., Excel) and documented references
Source Tests	Source tests can only be used if approved by SCAQMD staff
Air Monitoring Data	Any monitoring data used in the HRA should be provided.

Attachment A to Appendix C

HRA Summary

This summary form should accompany all HRAs and be presented at the beginning of the Executive Summary.

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

HEALTH RISK ASSESSMENT SUMMARY FORM

(Required in Executive Summary of HRA)

Facility Name : ______________________
Facility Address: ______________________
____
Type of Business: ______________________
SCAQMD ID No.: __________

A. Cancer Risk

(One in a million means one chance in a million of getting cancer from being constantly exposed to a certain level of a chemical over a period of time)

1. Inventory Reporting Year : __________
2. Maximum Cancer Risk to Receptors : *(Offsite and residence = 30-year exposure, worker = 25-year exposure)*
   a. Offsite ________ in a million Location: ______________________
   b. Residence ________ in a million Location: ______________________
   c. Worker ________ in a million Location: ______________________
3. Substances Accounting for 90% of Cancer Risk: ______________________
   Processes Accounting for 90% of Cancer Risk: ______________________
4. Cancer Burden for a 70-yr exposure: *(Cancer Burden = [cancer risk] x [# of people exposed to specific cancer risk])*
   a. Cancer Burden __________
   b. Number of people exposed to >1 per million cancer risk for a 70-yr exposure __________
   c. Maximum distance to edge of 70-year, 1 x 10^{-6} cancer risk isopleth (meters) __________

B. Hazard Indices

[Long Term Effects (chronic) and Short Term Effects (acute)]
(non-carcinogenic impacts are estimated by comparing calculated concentration to identified Reference Exposure Levels, and expressing this comparison in terms of a "Hazard Index")

1. Maximum Chronic Hazard Indices:
   a. Residence HI: ________ Location: ________ toxicological endpoint: ________
   b. Worker HI : ________ Location: ________ toxicological endpoint: ________
2. Substances Accounting for 90% of Chronic Hazard Index: ______________________
3. Maximum 8-hour Chronic Hazard Index:
   8-Hour Chronic HI: ________ Location: ________ toxicological endpoint: ________
4. Substances Accounting for 90% of 8-hour Chronic Hazard Index: ______________________
5. Maximum Acute Hazard Index:
   PMI: ________ Location: ________ toxicological endpoint: ________
6. Substances Accounting for 90% of Acute Hazard Index: ______________________

C. Public Notification and Risk Reduction

1. Public Notification Required? ____ Yes ____ No
   a. If 'Yes', estimated population exposed to risks > 10 in a million for a 30-year exposure, or an HI >1
   ____
2. Risk Reduction Required? ____ Yes ____ No

Appendix D

HRA Review Check List

The check list contained here is used by SCAQMD staff to standardize the review of HRAs. It is being provided to assist facilities and consultants in their risk assessment preparation.

Facility Name: ________________________________ Facility ID: ____________

Street Address: ____

City: ____________________________________ Zip Code: ____________

HRA Consultant: ________________________________ Reviewer: ____________

Dispersion Modeling

1. AERMOD Files
   a. Meteorology Input File ______________________
      Using Figure 2 and Table 8 the meteorological site should be the one closest to the facility.
      i. Closest to facility Yes___ No___
      ii. If not, is there a valid justification? Yes___ No___

2. Control
   a. Pollutant
      i. Pollutant ID (should be "Other") Yes___ No___
   b. Model Options ___ ___
      i. Use regulatory default (should be "Yes") Yes___ No___
      ii. Rural or Urban (should be "Urban") Yes___ No___
   c. Building Downwash ___ ___
      i. Include building downwash? (should be "Yes") Yes___ No___
   d. Terrain ___ ___
      i. Run with elevations Yes___ No___
   e. Averaging times ___ ___
      i. 1-Hour (should be "Yes") Yes___ No___
      ii. 3-Hour Yes___ No___
      iii. 8-Hour Yes___ No___
      iv. 24-Hour Yes___ No___
      v. Monthly Yes___ No___
      vi. Period (should be "Yes") Yes___ No___
      vii. Annual Yes___ No___

3. Sources
   a. Source and building locations agree with the plot plan Yes___ No___
   b. Stack heights are reasonable Yes___ No___
   c. Volume/area source dimensions are reasonable Yes___ No___
   d. Stack parameters are consistent with those provided in the report Yes ___ No ___

4. Receptors
    a. Grid receptors
        i. Included (should be "Yes") Yes___ No___
        ii. Spacing (should be no greater than 100 meters) Yes___ No___
            - Assumed spacing _______ meters
        iii. Elevations included (should be "Yes") Yes___ No___
    b. Property boundary receptors
        i. Included (should be "Yes") Yes___ No___
        ii. Spacing follows guidance in Table 2 Yes___ No___
            - Assumed spacing _____ meters
        iii. Elevations included (should be "Yes") Yes___ No___
    c. Sensitive receptors
        i. Included (should be "Yes" if cancer risks >1 in a million) Yes___ No___
        ii. Elevation included (should be "Yes") Yes___ No___
        iii. Verified from review of Thomas Guide or other source Yes___ No___
    d. Census block receptors
        i. Included (should be "Yes" if cancer risks >1 in a million) Yes___ No___
        ii. Elevation included (should be "Yes") Yes___ No___
    e. Pathway receptors included (should be "No") Yes ___ No___

5. Emission Rates
    a. Include rate factors (should be "No") Yes___ No___

6. Deposition and Depletion
    a. Include deposition (should be "No") Yes___ No___
    b. Dry depletion (should be "No") Yes___ No___
    c. Wet depletion (should by "No") Yes___ No___

7. Duplication of AERMOD Results
    a. Independently ran AERMOD Yes___ No___
    b. Average χ/Q first high values for each source group reproduced (not required; useful if diagnosing discrepancies) Yes___ ___
    c. Maximum 1-hour χ/Q first high values for each source group reproduced (not required; useful if diagnosing discrepancies) Yes___

<u>Residential Risk Assessment</u>

1. Enabled Pathways and Related Variables
    a. Drinking water (not required) Yes___ No___
    b. Fish water (not required) Yes___ No___
    c. Beef/dairy (pasture) (not required) Yes___ No___
    d. Home grown produce (required; should be "Yes") Yes___ No___
    e. Pigs, chickens, and/or eggs (not required) Yes___ No___
    f. Dermal absorption (required; should be "Yes) Yes___ No___
    g. Soil Ingestion (required; should be "Yes") Yes___ No___
    h. Mother's milk (required; should be "Yes") Yes___ No___
    i. Deposition velocity (should be 0.02 meters per second) Yes ___ No___

k. Exposure duration (should be 30 years) Yes___ No___
l. Cancer analysis method; Yes___ No___
(should be "RMP with OEHHA Derived")

m. Chronic non-cancer analysis method; Yes___ No___
should be "OEHHA Derived"

2. Duplication of HARP2 Results
   a. Independently performed residential risk assessment Yes___ No___
   b. PMI (i.e., maximum off-site cancer risk) reproduced Yes ___ No___
      i. Facility value ___________ AQMD value ___________
      ii. Facility location ___________ AQMD location ___________
      iii. Explanation if necessary ____
      ____

   c. Cancer MEIR reproduced Yes___ No___
      i. Facility value ___________ AQMD value ___________
      ii. Facility location ___________ AQMD location ___________
      iii. Explanation if necessary ____
      ____

   d. Independently verified the cancer risk isopleth map Yes___ No___
   e. Non-cancer chronic hazard index (i.e., chronic HI) reproduced Yes___ No___
      i. Facility value ___________ AQMD value ___________
      ii. Facility location ___________ AQMD location ___________
      iii. Explanation if necessary ____
      ____

   f. Independently verified the chronic HI isopleth map Yes___ No___
   g. Non-cancer acute hazard index(i.e., acute HI) reproduced Yes___ No___
      i. Facility value ___________ AQMD value ___________
      ii. Facility location ___________ AQMD location ___________
      iii. Explanation if necessary ____
      ____

   h. Independently verified the acute HI isopleth map Yes___ No___

<u>Worker Risk Assessment</u>

1. Enabled Pathways and Related Variables
   a. Drinking water (not required) Yes___ No ___
   b. Fish water (not required) Yes ___ No ___
   c. Beef/dairy (pasture) (not required) Yes ___ No ___
   d. Home grown produce (not appropriate; should be "No") Yes ___ No ___
   e. Pigs, chickens, and/or eggs (not required) Yes ___ No ___
   f. Dermal absorption (required; should be "Yes") Yes ___ No ___
   g. Soil Ingestion (required; should be "Yes") Yes ___ No ___
   h. Mother's milk (not appropriate; should be "No") Yes ___ No ___
   i. Deposition velocity (should be 0.02 meters per second) Yes ___ No ___
   j. Exposure duration (should be 25 years) Yes ___ No ___
   k. Cancer analysis method; should be "OEHHA Derived" Yes___ No ___

l. Facility Operating conditions hrs/day___ days/week___

- GLC adjustment factor (refer to Table 12)

m. Chronic analysis method; should be "OEHHA Derived" Yes___ No___

2. Duplication of HARP2 Results
   a. Independently performed worker risk assessment Yes___ No___
   b. Cancer MEIW reproduced Yes___ No___
      i. Facility value ___________ AQMD value ___________
      ii. Facility location ___________ AQMD location ___________
      iii. Explanation if necessary ____
      ____
   c. Non-cancer chronic hazard index (i.e., chronic HI) reproduced Yes___ No___
      i. Facility value ___________ AQMD value ___________
      ii. Facility location ___________ AQMD location ___________
      iii. Explanation if necessary ____
      ____

<u>Site Visit</u>

- Site visit conducted Yes___ No___
  Date ___________ Time ___________
- Confirmed location of the MEIR (cancer) Yes___ No___
- Confirmed location of the MEIW (cancer) Yes___ No___
- Confirmed location of the MEIR (chronic HI) Yes___ No___
- Confirmed location of the MEIW (chronic HI) Yes___ No___
- Confirmed location of the PMI (acute HI) Yes___ No___

Report____

<u>General Overall Comments</u>

ATTACHMENT L

South Coast Air Quality Management District

DRAFT Facility Prioritization Procedures For AB 2588 Program

~~March~~ June 2015

DRAFT

TABLE OF CONTENTS

I. INTRODUCTION …………………………………………………… 1

II FACILITY PRIORITIZATION PROCEDURE ….………………… 1

A. Calculation of Cancer Score …………………..…………. 2

B. Calculation of Non-Cancer Score …………….……..…. 4

C. Facility Ranking ……………………………………………… 6

III. REFERENCES ……………………………………………………… 14

I. INTRODUCTION

The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (commonly known as AB 2588) established a statewide program for the inventory of air toxics emissions from individual facilities as well as requirements for risk assessment and public notification of potential health risks. AB 2588 requires the South Coast Air Quality Management District (SCAQMD) to designate high, intermediate, and low priority categories and include each facility within the appropriate category based on its individual priority. In establishing priorities, the SCAQMD is to consider the potency, toxicity, quantity and volume of hazardous materials released from the facility; the proximity of the facility to potential receptors, including, but not limited to, hospitals, schools, daycare centers, worksites and residences; and any other factors that the SCAQMD finds and determines may indicate that the facility may pose a significant risk to receptors.

II. FACILITY PRIORITIZATION PROCEDURE

This document describes the facility prioritization procedure utilized by the SCAQMD. The procedure is based on the upcoming 2015 version of the Emissions and Potency Procedure recommended by the Facility Prioritization Guidelines of the AB 2588 Risk Assessment Committee of the California Air Pollution Control Officers Association (CAPCOA Procedures). The 2015 version of the CAPCOA procedure is expected to use the same methodology as the previous version of the CAPCOA procedures adopted in 1990, with the exception that a normalization factor has been updated to reflect updates to OEHHA's 2015 update to its Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (OEHHA Guidance Manual).

The CAPCOA Procedures primarily rely on three parameters to prioritize facilities: emissions, potency or toxicity, and the proximity to potential receptors. In September 1990, the SCAQMD refined the original CAPCOA Procedures to include adjustment factors for receptor proximity, exposure period, and averaging times in addition to the treatment of multi-pathway pollutants. In August 2004, SCAQMD revised its Procedures to accommodate the use of cancer potency factors (instead of unit risk factors) to allow for daily breathing rate and body weight variations as well as revised multi-pathway factors for resident and workers. In March 2011, the SCAQMD Procedures were revised to include updated toxicity criteria. This document supersedes the March 2011 Version to accommodate new risk calculation methodologies laid out in the 2015 OEHHA Guidance Manual.

For prioritization, a facility receives two scores: one for carcinogenic (cancer) effects and the other for non-cancer effects. The facility is then ranked based on the higher of these two scores. Three categories are used in the ranking: high priority (Category A), intermediate priority (Category B) and low priority (Category C). Based on the Total Facility Score (TS), facilities designated as high priority are required to submit Heath Risk Assessments to assess the risk to their surrounding community. Facilities ranked with intermediate priority are considered to be District tracking facilities, which are then required to submit complete toxics inventory once every four years. Facilities ranked with low priority are exempt from reporting. Due to the very conservative nature of the screening risk assessment used for prioritization, and consistent with

CAPCOA's Procedures, a priority score of 10 is equivalent to a calculated cancer risk of 100 per million or a HI of 10. The following table summarizes thresholds used to prioritize facilities:

Table 1

Total Facility Score (TS)	Category
TS > 10	High Priority
$1 < TS \leq 10$	Intermediate Priority
$TS \leq 1$	Low Priority

Facilities subject to AB2588 are required to submit a detailed list of their toxic emissions every four years (referred to as a quadrennial update). Based on their level of toxic and criteria pollutant emissions, each year a different group of facilities will report a detailed list of its toxic emissions. Upon initial prioritization of facilities, the SCAQMD staff conducts further analyses to verify the Priority Score such as confirming the distance to the sensitive receptors and workers, reviewing emissions trends and facility changes such as new or modified permitted equipment or pollution controls, and comparing the Priority Score results with the last Health Risk Assessment submittal or Risk Reduction Plan, if applicable. This additional information obtained through Priority Score auditing will often negate the need to ask for a Health Risk Assessment. If, however, the Prioritization Score remains high, the facility is asked to prepare an Air Toxics Inventory Report and Health Risk Assessment.

A. Calculation of Cancer Score

The facility scores for residential and worker cancer effects are calculated as follows:

$$TS_r = \sum\{(E_c)\,(CP_c)\,(10^{-6})\,(MP_{c,r})\}(RP)\,(676.63)\,(10^5), \text{ or}$$

$$TS_w = \sum\{(E_c)\,(CP_c)\,(10^{-6})\,(MP_{c,w})\}(RP)\,(WAF)\,(56.26)\,(10^5)$$

Where;

TS	= Total facility score, the sum of scores for all carcinogens
c	= Specific carcinogen
r	= Residential Receptor
w	= Worker Receptor
Ec	= Annual emissions of carcinogen, c (lbs/year)
CPc	= Cancer potency of carcinogen substance, c (mg/kg-day)-1
10^{-6}	= Micrograms to milligrams conversion, liters to cubic meters conversion
MPc	= Multi-pathway adjustment factor of carcinogen, c; there are separate multi-pathway factors for residence and worker; see Table 4
RP	= Receptor proximity adjustment factor, χ/Q ((µg/m^3)/(lbs/year))
WAF	= Worker Adjustment Factor (dimensionless)
676.63	= Residential Combined Exposure Factor that accounts for age-specific breathing rate, age specific factor, exposure duration, exposure frequency, and averaging time from 2015 OEHHA Guidance Manual
56.26	= Worker Combined Exposure Factor that accounts for age-specific breathing rate, age specific factor, exposure duration, exposure frequency, and averaging time from 2015 OEHHA Guidance Manual
10^5	= Scalar to adjust priority score to 1-10 scale

Annual Emissions:

Annual emissions of carcinogens are taken from the TACS and TACS-O Facility Summary Forms of the Annual Emission Reporting (AER) Program. Each toxic substance has a degree of accuracy associated with them that is a de-minimis emission level for reporting. As a result, facility-wide toxic emissions greater than one-half of their corresponding degree of accuracy are inventoried and reported. Conversely, total facility toxic emissions less than one-half of their corresponding degree of accuracy levels are not considered in the prioritization. The substances and associated degree of accuracy levels are listed in Table 3.

Cancer Potency:

The Cancer Potency factor (CP) is a measure of the cancer potency of a carcinogen. The cancer potency factor is the estimated probability that a person will contract cancer as a result of a daily inhalation of 1 milligram of the carcinogen per kilogram of body weight continuously over a period of 70 years. The cancer potency factors used in these procedures are published by the Office of Environmental Health Hazard Assessment (OEHHA). The latest CP values can be obtained from the following website: http://www.arb.ca.gov/toxics/healthval/healthval.htm

Multi-pathway Adjustment Factor:

The multi-pathway (MP_c) adjustment factor is used for carcinogens that may contribute to risk from exposure pathways other than inhalation. These substances deposit on the ground in particulate form and contribute to risk through ingestion of soil or backyard garden vegetables or through other routes. This factor is used to account for additional risks from exposure through non-inhalation pathways. The MP_c adjustment factors for specific carcinogens have been developed by SCAQMD staff by using the Health Risk Assessment Standalone Tool (RAST) developed by California Air Resources Board (CARB).[1] The MP_c factors also satisfy the requirements of the SCAQMD Risk Assessment Procedures for Rules 1401 and 212. The substances and associated MP_c adjustment factors for worker and residents are listed in Table 4. For cancer causing compounds that only affect the inhalation pathway, the MP_c adjustment factor is set to one. The SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (SCAQMD Rule 1401 HRA Procedures) can be obtained from the following web site:
http://www.SCAQMD.gov/home/permits/risk-assessment

Receptor Proximity Adjustment Factor:

The Receptor Proximity (RP) adjustment factor is calculated based on the distances from the facility to the nearest receptor. Receptor locations are off-site, where persons may be exposed to toxic emissions from equipment. The receptor distance is defined as the closest distance between any source of air toxic emissions at the facility and the property boundary of any one of the receptor locations. A distance of 50 meters is assumed for a facility without specified receptor distances corresponding to the highest adjustment factor. Separate RP adjustment factors are developed to serve different patterns of annual and hourly averaged wind conditions. The RP formulas in Table 2 below were developed based on the dispersion factors (χ/Q) developed for the SCAQMD Rule 1401 HRA Procedures. The RP adjustment factor is calculated from the following table:

[1] http://www.arb.ca.gov/toxics/harp/harp.htm

Table 2

Distance to Receptor (R in m)	Emission Rate	Receptor Proximity Adjustment Factor (RP)
R =< 50	Annual Concentration	0.030850
	Hourly Concentration	0.167129
R > 50	Annual Concentration	$105.4645 \times R^{(-2.08)}$
	Hourly Concentration	$176.6925 \times R^{(-1.78)}$

Worker Adjustment Factor:

The modeled annual average air concentration should be adjusted to the air concentration that the worker is actually exposed to if the source does not operate continuously. The worker adjustment factor is calculated by following equation:

$$WAF = ([H_{res}]/[H_{source}]) \times ([D_{res}]/[D_{source}])$$

Where,

$[H_{res}]$ = Number of hours per day the annual average residential air concentration is based on (always 24 hours)
$[H_{source}]$ = Number of hours the source operates per day
$[D_{res}]$ = Number of days per week the annual average residential air concentration is based on (always 7 days)
$[D_{source}]$ = Number of days the source operates per week

B. Calculation of Non-Cancer Score

For a toxic substance, non-cancer health effects can occur via acute, 8-hour chronic, and/or annual chronic exposure. All of these non-cancer effects are used in the facility prioritization. For each substance associated with acute, 8-hour and chronic toxicity, the SCAQMD calculates separate scores using the formulas shown below.

Non-Cancer Chronic Score:

For a facility which emits pollutants with known non-cancer chronic health effects, its scores for non-cancer effects are calculated as follows:

$$TS_r^* = \sum\{(E_{t)}\ (MP_{t,r})/(REL_{t)}\}(RP_r), \text{ or}$$

$$TS_w^* = \sum\{(E_{t)}\ (MP_{t,w})/(REL_{t)}\}(WAF)\ (RP_w)$$

Where;

TS^* = Total facility score, the sum of score for all substances with non-cancer effects
t = Toxic substance
r = Residential Receptor
w = Worker Receptor
E_t = Average hourly emissions of toxic substance, t (lbs/hr)
REL_t = Reference exposure level of toxic substance, t ($\mu g/m^3$)

MP_t = Multi-pathway adjustment factor of non-cancer chronic toxic substance, t; there are separate multi-pathway factors for residence and worker; see Table 4
RP = Receptor proximity adjustment factor, χ/Q ((µg/m^3)/(lbs/year))
WAF = Worker Adjustment Factor (dimensionless)

Non-Cancer 8-Hour Score:

For a facility which emits pollutants with known non-cancer 8-hour health effects, its scores for non-cancer effects are calculated as follows:

$$TS_r^* = \sum\{(E_{t)}/(REL_{t)}\}(WAF)\,(RP_r), \text{ or}$$

$$TS_w^* = \sum\{(E_{t)}/(REL_{t)}\}(WAF)\,(RP_w)$$

Where;

TS^* = Total facility score, the sum of score for all substances with non-cancer effects
t = Toxic substance
r = Residential Receptor
w = Worker Receptor
E_t = Average annual emissions of toxic substance, t (lbs/hr)
REL_t = Reference exposure level of toxic substance, t (µg/m^3)
RP = Receptor proximity adjustment factor, χ/Q ((µg/m^3)/(lbs/year))
WAF = Worker Adjustment Factor (dimensionless)

Non-Cancer Acute Score:

For a facility which emits pollutants with known non-cancer acute health effects, its score for non-cancer effects is calculated as follows:

$$TS^* = \sum\{(E_t)/(REL_{t)}\}(RP)$$

Where;

TS^* = Total facility score, the sum of score for all substances with non-cancer effects
t = Toxic substance
E_t = Maximum hourly emissions of toxic substance, t (lbs/hr)
REL_t = Reference exposure level of toxic substance, t (µg/m^3)
RP = Receptor proximity adjustment factor for hourly concentration, χ/Q ((µg/m^3)/(lbs/year))

Average and Maximum Hourly Emissions:

Two different emissions rates are required for calculating the facility score for non-cancer health effects. The methodology for calculating the non-cancer score for chronic exposure requires average hourly emissions (lbs/hr) for each emitted pollutant whereas calculation of the non-cancer score for acute exposure requires maximum hourly emissions (lbs/hr) for each emitted pollutant. Average hourly emission is obtained by dividing the pollutant annual emissions (lbs/yr) by 8760 hours. Maximum hourly emissions are obtained by dividing the pollutant annual emissions (lbs/yr) by the facility's actual operating hours that are then multiplied by a maximum hourly emission adjustment factor of 1.25. Annual emissions are taken from the TACS and TACS-O Facility Summary Forms of the AER Program. As specified in Section II.A, emissions of specified substances, which are below one-half of their corresponding degree of accuracy levels are neglected in the computation.

Reference Exposure Levels:

Reference Exposure Level (REL) is used as an indicator of potential adverse non-cancer health effects, and refers to a concentration level (µg/m^3) or dose (mg/kg-day) at which no adverse health effects are anticipated. The RELs used in these procedures are published by OEHHA. The latest REL values can be obtained from the following website:
http://www.arb.ca.gov/toxics/healthval/healthval.htm

Multi-Pathway Adjustment Factor:

The Multi-Pathway (MP_t) adjustment factor is used for chronic substances that may contribute to risk from exposure pathways other than inhalation. Similar to discussion in Section II.A, MP_t adjustment factors only exist for selected chronic pollutants which can be found in Table 4. There are separate MP factors for worker and residents. For non-cancer chronic health effects compounds that only affect the inhalation pathway, the MP_t adjustment factor is set to one (1.0).

Worker Adjustment Factor:

The modeled annual average air concentration should be adjusted to the air concentration that the worker is actually exposed to if the source does not operate continuously. This is the same adjustment factor used in the calculation of the facility cancer score discussed in Section II.A.

Receptor Proximity Adjustment Factor:

The Receptor Proximity (RP) adjustment factor is calculated based on the distances from the facility to the nearest residence and the nearest worksite. This is the same adjustment factor used in the calculation of the facility cancer score discussed in Section II.A.

C. Facility Ranking

From the computed scores for cancer and non-cancer effects, the total facility score is taken as the higher of the two scores, and serves as the basis for ranking a facility as follows:

- The facility is in the high category (Category A) if its highest score is greater than or equal to 10;
- The facility is in the intermediate category (Category B) if its highest score is greater than or equal to 1 but less than 10; and,
- The facility is in the low category (Category C) if its highest score is less than 1.

Table 3: De-Minimis Reporting Limits for Toxics

TAC Code	CAS	Substance	Degree of Accuracy (lbs/yr)
29	75070	Acetaldehyde	~~20~~17
30	107028	Acrolein	0.05
31	107131	Acrylonitrile	0.1
32	7664417	Ammonia	200
14	7440382	Arsenic and Compounds (inorganic)	~~0.01~~0.0015
1	1332214	Asbestos	~~0.0001~~2.3E-6
2	71432	Benzene	~~2~~1.7
3	7440417	Beryllium	0.001
4	106990	Butadiene [1,3]	0.1
5	7440439	Cadmium	0.01
6	56235	Carbon tetrachloride	1
33	463581	Carbonyl sulfide	100
34	7782505	Chlorine	0.5
35	67663	Chloroform	10
13	18540299	Chromium, hexavalent (and compounds)	~~0.0001~~1E-4
36	7440508	Copper	0.1
37	7631869	Crystalline silica	0.1
38	117817	Di(2-ethylhexyl) phthalate {DEHP}	~~20~~3.9
7	1080	Chlorinated dioxins and dibenzofurans	~~0.000001~~7.3E-8
	67562394	*1,2,3,4,6,7,8-Heptachlorodibenzofuran [POM]*	~~0.000001~~1E-6
	55673897	*1,2,3,4,7,8,9-Heptachlorodibenzofuran [POM]*	~~0.000001~~1E-6
	35822469	*1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin [POM]*	~~0.000001~~1E-6
	70648269	*1,2,3,4,7,8-Hexachlorodibenzofuran [POM]*	~~0.000001~~7.3E-7
	57117449	*1,2,3,6,7,8-Hexachlorodibenzofuran [POM]*	~~0.000001~~7.3E-7
	72918219	*1,2,3,7,8,9-Hexachlorodibenzofuran [POM]*	~~0.000001~~7.3E-7
	60851345	*2,3,4,6,7,8-Hexachlorodibenzofuran [POM]*	~~0.000001~~7.3E-7
	39227286	*1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin [POM]*	~~0.000001~~5.1E-7
	57653857	*1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin [POM]*	~~0.000001~~5.1E-7
	19408743	*1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin [POM]*	~~0.000001~~5.1E-7
	39001020	*1,2,3,4,5,6,7,8-Octachlorodibenzofuran [POM]*	~~0.000001~~1E-6
	3268879	*1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin [POM]*	~~0.000001~~1E-6
	57117416	*1,2,3,7,8-Pentachlorodibenzofuran [POM]*	~~0.000001~~1E-6
	57117314	*2,3,4,7,8-Pentachlorodibenzofuran [POM]*	~~0.000001~~2.4E-7
	40321764	*1,2,3,7,8-Pentachlorodibenzo-p-dioxin [POM]*	~~0.000001~~5.1E-8
	51207319	*2,3,7,8-Tetrachlorodibenzofuran [POM]*	~~0.000001~~7.2E-8
	1746016	*2,3,7,8-Tetrachlorodibenzo-p-dioxin {TCDD} [POM]*	~~0.000001~~5.1E-8
27	78875	1,2-Dichloropropane {Propylene dichloride}	20
28	542756	1,3-Dichloropropene	10
72	9901	Diesel exhaust particulates	0.1
39	131113	Dimethyl phthalate	50
8	123911	1,4-Dioxane	5
40	100414	Ethyl benzene	~~200~~20
9	106934	Ethylene dibromide {1,2-Dibromoethane}	0.5

Table 3: De-Minimis Reporting Limits for Toxics

TAC Code	CAS	Substance	Degree of Accuracy (lbs/yr)
10	107062	Ethylene dichloride {1,2-Dichloroethane}	2
11	75218	Ethylene oxide	0.5
22	1104	Fluorocarbons (chlorinated)	1
	76131	*Chlorinated fluorocarbon {CFC-113}*	1
	75434	*Dichlorofluoromethane {Freon 12}*	1
	75694	*Trichlorofluoromethane {Freon 11}*	1
12	50000	Formaldehyde	5
41	1115	Glycol ethers and their acetates	100
	111466	*Diethylene glycol*	100
	111966	*Diethylene glycol dimethyl ether*	100
	112345	*Diethylene glycol monobutyl ether*	100
	111900	*Diethylene glycol monoethyl ether*	100
	111773	*Diethylene glycol monomethyl ether*	100
	25265718	*Dipropylene glycol*	100
	34590948	*Dipropylene glycol monomethyl ether*	100
	629141	*Ethylene glycol diethyl ether*	100
	110714	*Ethylene glycol dimethyl ether*	100
	111762	*Ethylene glycol monobutyl ether*	200
	110805	*Ethylene glycol monoethyl ether*	50
	111159	*Ethylene glycol monoethyl ether acetate*	100
	109864	*Ethylene glycol monomethyl ether*	10
	110496	*Ethylene glycol monomethyl ether acetate*	200
	2807309	*Ethylene glycol monopropyl ether*	100
	107982	*Propylene glycol monomethyl ether*	200
	108656	*Propylene glycol monomethyl ether acetate*	100
	112492	*Triethylene glycol dimethyl ether*	100
42	118741	Hexachlorobenzene	~~0.1~~0.096
43	608731	Hexachlorocyclohexanes	~~0.05~~0.008
	319846	*alpha-Hexachlorocyclohexane*	~~0.1~~0.008
	319857	*beta-Hexachlorocyclohexane*	~~0.1~~0.008
	58899	*Lindane {gamma-Hexachlorocyclohexane}*	~~0.1~~0.03
44	110543	Hexane	200
45	302012	Hydrazine	0.01
46	7647010	Hydrochloric acid	20
73	7664393	Hydrogen fluoride (hydrofluoric acid)	~~50~~20
47	7783064	Hydrogen sulfide	5
48	1125	Isocyanates and diisocyanates	0.05
	822060	*Hexamethylene-1,6-diisocyanate*	0.05
	624839	*Methyl isocyanate*	1
	101688	*Methylene diphenyl diisocyanate {MDI} [POM]*	0.1
	1204	*Toluene diisocyanates*	0.1
	584849	*Toluene-2,4-diisocyanate*	0.1
	91087	*Toluene-2,6-diisocyanate*	0.1
15	7439921	Lead compounds (inorganic)	~~0.5~~0.36

Table 3: De-Minimis Reporting Limits for Toxics

TAC Code	CAS	Substance	Degree of Accuracy (lbs/yr)
49	7439965	Manganese	0.1
		Mercury and mercury compounds	
	7487947	*Mercuric chloride*	~~1~~0.9
50	7439976	*Mercury*	~~1~~0.9
	593748	*Methyl mercury {Dimethylmercury}*	1
51	67561	Methanol	200
52	74873	Methyl chloride {Chloromethane}	20
23	71556	Methyl chloroform {1,1,1-Trichloroethane}	1
53	78933	Methyl ethyl ketone {2-Butanone}	200
54	108101	Methyl isobutyl ketone {Hexone}	20
55	1634044	Methyl tert-butyl ether	~~200~~96
16	75092	Methylene chloride {Dichloromethane}	~~50~~49.1
17	7440020	Nickel	0.1
57	106467	P-Dichlorobenzene {1,4-Dichlorobenzene}	~~5~~4.3
	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.2
	83329	*Acenaphthene [PAH, POM]*	1
	208968	*Acenaphthylene [PAH, POM]*	1
	120127	*Anthracene [PAH, POM]*	1
	56553	*Benz[a]anthracene [PAH, POM]*	~~0.5~~0.02
	50328	*Benzo[a]pyrene [PAH, POM]*	~~0.05~~0.002
	205992	*Benzo[b]fluoranthene [PAH, POM]*	~~0.5~~0.02
	192972	*Benzo[e]pyrene [PAH, POM]*	0.5
	191242	*Benzo[g,h,i]perylene [PAH, POM]*	0.5
	205823	*Benzo[j]fluoranthene [PAH, POM]*	~~0.5~~0.02
	207089	*Benzo[k]fluoranthene [PAH, POM]*	~~0.5~~0.02
	218019	*Chrysene [PAH, POM]*	~~1~~0.2
19	53703	*Dibenz[a,h]anthracene [PAH, POM]*	~~0.1~~0.005
	192654	*Dibenzo[a,e]pyrene [PAH, POM]*	~~0.05~~.0002
	189640	*Dibenzo[a,h]pyrene [PAH, POM]*	~~0.001~~0.0002
	189559	*Dibenzo[a,i]pyrene [PAH, POM]*	~~0.001~~0.0002
	191300	*Dibenzo[a,l]pyrene [PAH, POM]*	~~0.001~~0.0002
	206440	*Fluoranthene [PAH, POM]*	0.5
	86737	*Fluorene [PAH, POM]*	0.5
	193395	*Indeno[1,2,3-cd]pyrene [PAH, POM]*	~~0.5~~0.02
	91576	*2-Methyl naphthalene [PAH, POM]*	1
	91203	*Naphthalene [PAH, POM]*	0.1
	198550	*Perylene [PAH, POM]*	0.5
	85018	*Phenanthrene [PAH, POM]*	0.5
	129000	*Pyrene [PAH, POM]*	0.5
56	1336363	PCBs (Polychlorinated biphenyls) [POM]	~~0.01~~0.0002
58	87865	Pentachlorophenol	~~10~~9.6
18	127184	Perchloroethylene {Tetrachloroethene}	5
59	7723140	Phosphorus	0.1

Table 3: De-Minimis Reporting Limits for Toxics

TAC Code	CAS	Substance	Degree of Accuracy (lbs/yr)
60		Phosphorous compounds	
	7803512	*Phosphine*	0.01
	7664382	*Phosphoric acid*	50
	10025873	*Phosphorus oxychloride*	0.1
	10026138	*Phosphorus pentachloride*	0.1
	1314563	*Phosphorus pentoxide*	0.1
	7719122	*Phosphorus trichloride*	0.1
	126738	*Tributyl phosphate*	100
	78400	*Triethyl phosphine*	100
	512561	*Trimethyl phosphate*	100
	78308	*Triorthocresyl phosphate [POM]*	0.5
	115866	*Triphenyl phosphate [POM]*	100
	101020	*Triphenyl phosphite [POM]*	100
61		POMS and PAH-derivatives	
	226368	*Dibenz[a,h]acridine [POM]*	~~0.5~~0.02
	224420	*Dibenz[a,j]acridine [POM]*	~~0.5~~0.02
	194592	*7H-Dibenzo[c,g]carbazole*	~~0.05~~0.002
	57976	*7,12-Dimethylbenz[a]anthracene [PAH-Derivative, POM]*	~~0.0001~~9E-5
	42397648	*1,6-Dinitropyrene [PAH-Derivative, POM]*	~~0.001~~2E-4
	42397659	*1,8-Dinitropyrene [PAH-Derivative, POM]*	~~0.05~~0.002
	56495	*3-Methylcholanthrene [PAH-Derivative, POM]*	~~0.001~~9.8E-4
	3697243	*5-Methylchrysene [PAH-Derivative, POM]*	~~0.05~~0.002
	101779	*4,4'-Methylenedianiline (and its dichloride) [POM]*	~~0.1~~0.015
	602879	*5-Nitroacenaphthene [POM]*	~~2~~0.17
	7496028	*6-Nitrochrysene [PAH-Derivative, POM]*	~~0.001~~2E-4
	607578	*2-Nitrofluorene [PAH-Derivative, POM]*	~~5~~0.2
	5522430	*1-Nitropyrene [PAH-Derivative, POM]*	~~0.5~~0.02
	57835924	*4-Nitropyrene [POM]*	~~1~~0.02
62	75569	Propylene oxide	10
63	91225	Quinoline	100
64		Selenium and compounds	
	7783075	*Hydrogen selenide*	0.1
	7782492	*Selenium*	0.5
	7446346	*Selenium sulfide*	0.1
65	1310732	Sodium hydroxide	2
66	100425	Styrene	100
24	79345	1,1,2,2-Tetrachloroethane	~~1~~0.86
67		Sulfuric acid and oleum	
	8014957	*Oleum*	~~100~~2
	7664939	*Sulfuric acid*	2
	7446719	*Sulfuric trioxide*	~~100~~2
68	108883	Toluene	200
25	79005	1,1,2-Trichloroethane {Vinyl trichloride}	~~1~~3
20	79016	Trichloroethylene	20

Table 3: De-Minimis Reporting Limits for Toxics

TAC Code	CAS	Substance	Degree of Accuracy (lbs/yr)
26	95636	1,2,4-Trimethylbenzene	5
69	51796	Urethane {Ethyl carbamate}	0.1
21	75014	Vinyl chloride	0.5
70	1330207	Xylenes	200
	108383	*m-Xylene*	200
	95476	*o-Xylene*	200
	106423	*p-Xylene*	200
71	75456	Chlorodifluoromethane {Freon 22}	200

Table 4 Multi-pathway Adjustment Factor

CAS	Substance	Cancer Risk		Chronic Hazard	
		Residential	Worker	Residential	Worker
1080	Polychlorinated Dibenzo-p-Dioxins (PCDD) (as 2,3,7,8-Eqiv)	18.187	7.584	154.968	6.726
1151	Polycyclic Aromatic Hydrocarbon (PAHs)	23.116	6.619	1.000	1.000
50328	Benzo[a]pyrene	23.116	6.619	1.000	1.000
53703	Dibenz[a,h]anthracene	7.989	2.485	1.000	1.000
56495	Methylcholanthrene, 3-	7.989	2.485	1.000	1.000
56553	Benz[a]anthracene	23.116	6.619	1.000	1.000
57976	Dimethylbenz[a]anthracene, 7,12-	7.989	2.485	1.000	1.000
58899	Hexachlorocyclohexane, gamma- (lindane)	5.387	1.252	1.000	1.000
101779	Methylene dianiline, 4,4'- (and its dichloride)	7.220	2.472	1.000	1.000
117817	Bis(2-ethylhexyl)phthalate (DEHP)	5.221	1.048	1.000	1.000
189559	Dibenzo[a,i]pyrene	23.116	6.619	1.000	1.000
189640	Dibenzo[a,h]pyrene	23.116	6.619	1.000	1.000
191300	Dibenzo[a,l]pyrene	23.116	6.619	1.000	1.000
192654	Dibenzo[a,e]pyrene	23.116	6.619	1.000	1.000
193395	Indeno(1,2,3-C,D)pyrene	23.116	6.619	1.000	1.000
194592	Dibenzo[c,g]carbazole, 7H-	23.116	6.619	1.000	1.000
205823	Benzo[j]fluoranthene	23.116	6.619	1.000	1.000
205992	Benzo[b]fluoranthene	23.116	6.619	1.000	1.000
207089	Benzo[k]fluoranthene	23.116	6.619	1.000	1.000
218019	Chrysene	23.116	6.619	1.000	1.000
224420	Dibenz[a,j]acridine	23.116	6.619	1.000	1.000
226368	Dibenz[a,h,]acridine	23.116	6.619	1.000	1.000
319846	alpha-Hexachlorocyclohexane	5.387	1.252	1.000	1.000
319857	beta-Hexachlorocyclohexane	5.387	1.252	1.000	1.000
602879	Nitroacenaphthene, 5-	7.989	2.485	1.000	1.000
607578	Nitrofluorene, 2-	23.116	6.619	1.000	1.000
608731	Hexachlorocyclohexane (technical grade)	5.387	1.252	1.000	1.000
1336363	Polychlorinated biphenyls (PCBs)	18.939	13.118	1.000	1.000
1746016	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	25.719	7.584	307.600	6.726
3268879	Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9-	25.719	7.585	302.952	6.640
3697243	Methylchrysene, 5-	23.116	6.619	1.000	1.000
5522430	Nitropyrene, 1-	23.116	6.619	1.000	1.000
7439921	Lead and lead compounds	11.415	5.826	1.000	1.000
7439976	Mercury and mercury compounds (inorganic)	1.000	1.000	3.861	2.109
7440382	Arsenic and arsenic compounds (inorganic)	9.712	4.519	88.029	28.374
7440439	Cadmium and cadmium compounds	1.000	1.000	1.976	1.201
7446346	Selenium sulfide	1.000	1.000	195.576	23.710
7487947	Mercuric chloride	1.000	1.000	3.861	2.109
7496028	Nitrochrysene, 6-	23.116	6.619	1.000	1.000
7664393	Hydrogen fluoride (hydrofluoric acid)	1.000	1.000	6.064	2.987

Table 4 Multi-pathway Adjustment Factor

CAS	SUBSTANCE	Cancer Risk		Chronic Hazard	
		Residential	Worker	Residential	Worker
7782492	Selenium and selenium compounds, other than hydrogen selenide	1.000	1.000	195.576	23.710
18540299	Chromium, hexavalent	1.597	1.023	2.436	1.000
19408743	Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	25.719	7.584	307.600	6.726
35822469	Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	25.719	7.584	307.600	6.726
39001020	Octachlorodibenzofuran, 1,2,3,4,6,7,8,9-	18.187	7.585	152.633	6.640
39227286	Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	25.719	7.584	307.600	6.726
40321764	Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	25.719	7.584	307.600	6.726
42397648	Dinitropyrene, 1,6-	23.116	6.619	1.000	1.000
42397659	Dinitropyrene, 1,8-	23.116	6.619	1.000	1.000
51207319	Tetrachlorodibenzofuran, 2,3,7,8-	18.187	7.584	154.968	6.726
55673897	Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	18.187	7.584	154.968	6.726
57117314	Pentachlorodibenzofuran, 2,3,4,7,8-	18.187	7.585	152.633	6.640
57117416	Pentachlorodibenzofuran, 1,2,3,7,8-	18.187	7.585	152.633	6.640
57117449	Hexachlorodibenzofuran, 1,2,3,6,7,8-	18.187	7.584	154.968	6.726
57653857	Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	25.719	7.584	307.600	6.726
57835924	Nitropyrene, 4-	23.116	6.619	1.000	1.000
60851345	Hexachlorodibenzofuran, 2,3,4,6,7,8-	18.187	7.584	154.968	6.726
67562394	Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	18.187	7.584	154.968	6.726
70648269	Hexachlorodibenzofuran, 1,2,3,4,7,8-	18.187	7.584	154.968	6.726
72918219	Hexachlorodibenzofuran, 1,2,3,7,8,9-	18.187	7.584	154.968	6.726

III. REFERENCES

OEHHA, 2015. **Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment.** Prepared by Office of Environmental Health Hazard Assessment OEHHA, February 2015.

OEHHA, 2015. **Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values.** Prepared by Office of Environmental Health Hazard Assessment OEHHA. http://www.arb.ca.gov/toxics/healthval/contable.pdf.

CAPCOA, 2015 (*In Preparation)*. **Air Toxics "Hot Spots" Program - Facility Prioritization Guidelines**. Prepared by the AB2588 Risk Assessment Committee of the California Air Pollution Control Officers Association, 2015.

SCAQMD, 2015. **DRAFT Risk Assessment Procedures for Rules 1401 and 212**. Prepared by South Coast Air Quality Management District, www.AQMD.gov/permit/RiskAssessment.html.

SCAQMD, 2015. **Proposed Amended Rule 1401 - New Source Review of Toxic Air Contaminants.** Prepared by South Coast Air Quality Management District.

SCAQMD, 2015. **Proposed Amended Rule 212 - Standards For Approving Permits and Issuing Public Notice.** Prepared by South Coast Air Quality Management District.