

South Coast Air Quality Management District



RISK ASSESSMENT PROCEDURES for Rules 1401, 1401.1 and 212

Version 8.1

September 1, 2017

Preface

This document describes the procedures for preparing risk assessments under Rule 1401 - New Source Review of Toxic Air Contaminants, Rule 1401.1 - Requirements for New and Relocated Facilities Near Schools, and Rule 212 – Standards for Approving Permits and Issuing Public Notice. This version of the Risk Assessment Procedures for Rules 1401, 1401.1 and 212 updates the previous Version 8.0 which was updated in 2015 to incorporate the California Office of Environmental Health Hazard Assessment “Air Toxics Hot Spots Program Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments” (2015 OEHHA Guidelines). This is intended to be a "living" document, which staff will update periodically with updated meteorological data and dispersion model versions. This preface and the summary table provide an easy reference to identify the changes between versions of the SCAQMD’s Risk Assessment Procedures and Attachments containing the screening tables. The major revisions to this document (Version 8.1) from the previous version (Version 8.0) include:

- Revising the emission factors and speciation profiles for gasoline dispensing facilities (refer to Appendix X);
- Adding screening tables for spray booth sources (refer to Appendix XI and Attachment N, Tables 13.1 – 13.3);
- Updating the meteorological data for all screening tables (refer to Appendix VI); and
- Updating the list of TACs approved by OEHHA subject to Rule 1401 (refer to Attachment N);
- Reorganization of tables in Attachment N for ease of use.

Summary of Changes

SCAQMD Risk Assessment Procedures	Version 8.1	Version 8.0	Version 7.0
Date of Rule 1401 Adoption	September 1, 2017	June 5, 2015	March 4, 2005
Applies to Permit Applications Deemed Complete On Or After	October 1, 2017	July 5, 2015	July 1, 2005
OEHHA Reference Document	Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, adopted on March 6, 2015	Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, adopted on March 6, 2015	Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, finalized in August 2003
SCAQMD Permit Application Package	Attachment N	Attachment M (does not apply to spray booths or gasoline dispensing facilities)	Attachment L
Dispersion Model	AERMOD (Version 16216r)	AERMOD (Version 14134)	ISC-ST3 (Version 99155)
Meteorological Data Model	AERMET (Version 16216)	AERMET (Version 14134)	N/A
Meteorological Data Years	2010-2016	2006-2012	1981

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PERMIT APPLICATION PACKAGE “N”

(Also referred to as Attachment N)

For use in conjunction with Risk Assessment Procedures (Version 8.1)

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.

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 – Requirements for New and Relocated Facilities Near Schools 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 Preparation of Health Risk Assessments” (2015 OEHHA Guidelines) prepared by the Office of Environmental Health Hazard Assessment (OEHHA) and approved on March 6, 2015. The 2015 OEHHA Guidelines, which may be found at: <https://oehha.ca.gov/air/crrn/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0>, supersedes OEHHA’S 2003 version of risk assessment guidelines. The 2015 OEHHA Guidelines incorporates age sensitivity factors which will increase cancer risk estimates to residential and sensitive receptors by approximately three times, and more than three times in some cases depending on whether the TAC has multiple pathways of exposure in addition to inhalation. Under the 2015 OEHHA Guidelines, 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.

SCAQMD’s Risk Assessment Procedures (Version 8.0) was updated June 2015 to incorporate the 2015 OEHHA Guidelines. Spray booths and gasoline dispensing facilities were exempted under Rule 1401 from using Version 8.0 to allow SCAQMD staff more time to assess the permitting impacts with this change. Version 8.1 (this current document) uses the same risk assessment procedures as Version 8.0, but now includes spray booths and gasoline dispensing facilities to reflect amendments to Rule 1401 in 2017.

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 a 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, non-cancer 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:

$$\text{Dose} = \text{Concentration} \times \text{Exposure}$$

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 that are 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). Most recently, Rule 1401 was amended on June 5, 2015 to incorporate the 2015 OEHHA Guidelines for calculating health risks.

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/scaqmd-rule-book>.

Under Rule 1401, the following requirements must be met before a permit is granted for affected equipment.

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- The cumulative increase from all TACs emitted from a single piece of equipment in MICR shall not exceed:
 - one in one million (1.0×10^{-6} or 1E-06) if Best Available Control Technology for Toxics (T-BACT) is not used; or,
 - ten in one million (10×10^{-6} or 10E-06) 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 HIA and HIC for new and relocated facilities emitting TACs 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, 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. For facilities with a single permitted piece of equipment, the MICR level must not exceed ten in a million. The circulation and distribution of the notifications must meet the criteria in Rule 212.

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, including all electronic modeling files, 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 2015 OEHHA Guidelines “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 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 - Equipment not Requiring a Written Permit Pursuant to Regulation II and filing for a permit to operate within one year of removing the Rule 219 exemption;
 - Modifications to terminate research projects; and
 - Emergency internal combustion engines (ICEs) exempt under Rule 1304 - Exemptions.

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 TACs 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 (refer to Table I of Rule 1401). The first table in the Attachment lists the TACs subject to Rules 1401, 1401.1 and Rule 212. Determine the date on which the application was deemed complete and refer to the appropriate Attachments.

Default toxic emission factors for TACs associated with combustion equipment have been developed for use in the AB2588 Program¹. If better source specific data is available, such as

¹SCAQMD’s Supplemental Instructions are available on the SCAQMD website at:
<http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-ab2588-facilities.pdf>

SCAQMD approved source tests, manufacturer's data, or fuel analysis, 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 Engineering and Permitting staff should be consulted regarding approved techniques for identifying toxic air 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.

DEFINITIONS

Before proceeding, it is important to understand some of the terms used when performing a health risk assessment. These terms are commonly used throughout this document.

Dispersion Factor (χ/Q)

The concentration of a contaminant decreases as it travels away from the site of release and spreads out or "dispersed." 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 ($\mu\text{g}/\text{m}^3$) 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.

Molecular Weight Adjustment Factor (MWAF)

MWAFs should be used when calculating the cancer risk. For most of the 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 Reference Exposure Levels (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 7440-02-0, “Nickel”), and these cases do not use any further molecular weight adjustment. The appropriate MWF to be used along with the OEHHA cancer potency factors, acute and chronic RELs for Hot Spots metals can be found in the MWF column of the table containing OEHHA and California Air Resources Board’s (CARB) Approved Health Values for use in Hot Spots Facility Risk Assessments (Consolidated Health Values Table), which is available at: <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Cancer Potency (CP) Factor

The CP 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 CP factors in these procedures were approved by the state Scientific Review Panel and prepared by OEHHA. The CP can be found in the Consolidated Health Values Table, which is available at: <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Reference Exposure Level (REL)

The concentration level at or below which no adverse non-cancer health effects are anticipated for a specified exposure duration is termed the 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. The REL can be found in the Consolidated Health Values Table, which is available at: <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Multi-Pathway (MP) Adjustment Factor

The MP adjustment factor 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 adjustment factor estimates the total risk in comparison to a given inhalation risk. MP adjustment factors are provided in Attachment N, Tables 3.1 and 3.2. 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.

Daily Breathing Rate (DBR)

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., third trimester, 0-2, 2-16, and 16-30 years). CARB is developing an updated Risk Management Policy (RMP) that includes recommendations for inhalation exposures. Information regarding CARB’s RMP can be located at: <http://www.arb.ca.gov/toxics/toxics.htm>. For residential exposures, CARB’s RMP recommends using the high end DBR (e.g., 95th percentile) for children from the third trimester through age 2, and 80th percentile DBR for all other ages. This is reflected in Attachment N, Tables 4.1A – 4.2D. 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 eight hours per day during work days.

Age Sensitivity Factor (ASF)

Scientific data have shown that young animals are more sensitive than adult animals to exposure to many carcinogens. Therefore, OEHHA developed 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.

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).

Fraction of Time Spent at Home (FAH)

OEHHA and CARB 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 percent of the work day. For Tiers 1, 2, and 3 screening purposes, the FAH is assumed to be 1 for ages third 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 percent of their time at home.

Exposure Frequency (EF)

EF is the number of days per year of exposure for the given scenario (i.e. residential, worker). OEHHA recommends the use of 350 days/year for residential exposure (applicable to 30-year risk assessments), and 250 days/year for worker exposure. This equates to $EF = 0.96$ for residential exposure and $EF = 0.68$ for worker exposure.

Averaging Time (AT)

AT is the lifetime exposure period OEHHA used to develop the cancer potency values. 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.

Worker Adjustment Factor (WAF)

In risk assessments, long-term averages are typically used for cancer risk calculations for residents and workers. Therefore, for an off-site worker, the long-term average should represent what the worker breathes 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 eight hours per day and five 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

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residential exposure and facility schedule. For screening purposes, the off-site worker schedule is assumed to always overlap with the facility's operating schedule.

Tier 1: Screening Emission Levels

OVERVIEW OF TIER 1

Tier 1 involves a simple look-up table (Attachment N, Table 1.0) 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 a 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.

Tier 1 may be used only for a single emission source and a single TAC. 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 Attachment N, Table 1.0. 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 Attachment N, Table 1.0 were determined by back calculation, using the highest χ/Q established in Attachment N, Tables 6.1 A through 7.6 B that would not exceed a cancer risk of one in one million or an HIC, HIC8 or HIA 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 Attachment N, Table 1.0. For each acute compound, divide the maximum hourly emission (in pounds per hour, Q_{lbph}) of each TAC by the Hourly Pollutant Screening Level ($PSL_{TAC, Hourly}$) as contained in Attachment N, Table 1.0.

$$PSI_{TAC, Cancer, 8-hr, or Chronic} = Q_{lbpy, TAC} / PSL_{TAC, Annual}$$

$$PSI_{TAC, Acute} = Q_{lbph, TAC} / PSL_{TAC, Hourly}$$

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2. Calculate the Application Screening Index (ASI). Sum up the individual Pollutant Screening Indices for all chronic, 8-hour and carcinogenic pollutants (PSI_P) and, separately, for all acute TACs.

$$ASI_{\text{cancer,8-hr,chronic}} = PSI_{TAC1,\text{cancer,8-hr,chronic}} + PSI_{TAC2,\text{cancer,8-hr,chronic}} + PSI_{TAC3,\text{cancer,8-hr,chronic}} + \dots$$

$$ASI_{\text{acute}} = PSI_{TAC1,\text{acute}} + PSI_{TAC2,\text{acute}} + PSI_{TAC3,\text{acute}} + \dots$$

3. Neither the $ASI_{\text{cancer,8-hr,chronic}}$, 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, HIA, HIC8, and HIC. 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 27)

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 hour/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, HIC8 and HIC, 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 HIA, 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 any residence including private homes, condominiums, apartments, and living quarters; schools, including preschools and daycare centers; health facilities such as hospitals, retirement and nursing homes, long term care hospitals, hospices; in addition to prisons, dormitories or similar live-in housing, where children, chronically ill individuals or other sensitive persons could be exposed to TACs.

When identifying receptor locations in order to calculate cancer risk, HIC8 or HIC, 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 HIA, all off-site locations where there is the potential for acute exposure should be considered (i.e. fence-line receptor). Refer to Rule 1401 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:

$$\text{MICR} = \text{Cancer Potency (CP)} \times \text{Dose (D)} \times 10^{-6}$$

Where:

$$\text{Dose} = \text{Concentration} \times \text{Exposure}$$

$$\text{Concentration} = \text{GLC} = (\text{Q}_{\text{tpy}} \times \chi/\text{Q}) \times \text{MWF}$$

$$\text{CEF}_R = (\text{Exposure}_{0.25-0} + \text{Exposure}_{0-2} + \text{Exposure}_{2-16} + \text{Exposure}_{16-30}) \times \text{EF}_R / \text{AT}$$

$$\text{Exposure}_{\text{AgeBin}} = \text{DBR}_{\text{AgeBin}} \times \text{ED}_{\text{AgeBin}} \times \text{ASF}_{\text{AgeBin}} \times \text{FAH}_{\text{AgeBin}}$$

$$\text{Exposure}_R = \text{CEF}_R \times \text{MP}_R$$

$$\text{CEF}_W = \text{DBR}_W \times \text{ED}_W \times \text{EF}_W / \text{AT}$$

$$\text{Exposure}_W = \text{CEF}_W \times \text{MP}_W \times \text{WAF}$$

You may also use the following equation using **default combined exposure factor**, found in Tables 4.1D and 4.2D of Attachment N:

$$\text{MICR}_R = \text{CP} \times \text{Q}_{\text{tpy}} \times \chi/\text{Q} \times \text{MWF} \times \text{CEF}_R \times \text{MP}_R \times 10^{-6}$$

$$\text{MICR}_W = \text{CP} \times \text{Q}_{\text{tpy}} \times \chi/\text{Q} \times \text{MWF} \times \text{CEF}_W \times \text{MP}_W \times \text{WAF} \times 10^{-6}$$

For Tier 2 screening risk assessment procedures for short-term projects, refer to Appendix XII.

Terminology Reference Guide

Term	Description	Where to Find
GLC	Ground Level Concentration = $Q_{\text{tpy}} \times \chi/Q$	
Q_{tpy}	Maximum emission rate (tons/year)	Emission estimate specific to permit unit
χ/Q	Concentration at a receptor distance / Emission Rate [$(\mu\text{g}/\text{m}^3)/(\text{tons}/\text{year})$]	Attachment N, applicable Table by source type
MWAF	Molecular Weight Adjustment Factor	Consolidated Health Values Table ²
CP	Cancer Potency $(\text{mg}/\text{kg}\text{-day})^{-1}$	
REL	Reference Exposure Level $(\mu\text{g}/\text{m}^3)$	
MP	Multi-Pathway Adjustment Factor (if applicable)	Attachment N, Table 3.1 and 3.2
CEF	Combined Exposure Factor	Attachment N, Tables 4.1 A – 4.2 D
DBR	Daily breathing rate $(\text{L}/\text{kg body weight}\text{-day})$	Attachment N, Tables 4.1 A – 4.2 D
ASF	Age Specific factor (unitless)	Attachment N, Tables 4.1 A – 4.2 D
ED_R	Exposure Duration (30 years) – Residential	Attachment N, Tables 4.1 A – 4.1 E
ED_W	Exposure Duration (25 years) – Worker	Attachment N, Tables 4.2 A – 4.2 D
FAH	Fraction of Time Spent at Home (unitless)	Attachment N, Tables 4.1 A – 4.1 E
EF_R	Exposure Frequency, Residential = 0.96 (350 days / 365 days), unitless	Attachment N, Tables 4.1 A – 4.1 E
EF_W	Exposure Frequency, Worker = 0.68 (250 days / 365 days), unitless	Attachment N, Tables 4.2 A – 4.2 D
AT	Averaging Time (lifetime exposure = 70 years)	
WAF	Worker Adjustment Factor	Attachment N, Tables 5.1 and 5.2
10^{-6}	Micrograms to milligrams conversion, liters to cubic meters conversion	Not applicable

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 χ/Q are expressed in tons/year.

² Available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

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 hours/day or less; or
- More than 12 hours/day

Step 5: Identify the Appropriate Meteorological Station

Appendix VI provides the locations of meteorological stations in the South Coast Air Basin (Basin) used for these calculations. Using Appendix VI, Figure VI-1, or the links below, determine the Source/Receptor Area (SRA) for the permit unit. Use Appendix VI, Table VI-1 to determine the meteorological site most appropriate to use for the permit unit's SRA. Additional information on how to select the appropriate SRA can be found on SCAQMD's website at <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. For all receptor locations, the distance should be measured from the source to the edge of the property line of the nearest receptor.

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 point source, the receptor distance is the distance from the center of the stack to the nearest receptor location.

For a volume source, the receptor distance is the distance from the edge of the building 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

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**. All screening tables are available in the Attachment – Permit Application Package “N” (also referred to as Attachment N), which is to be used in conjunction with these procedures. The Attachment contains χ/Q values for non-combustion sources; combustion sources such as diesel reciprocating internal combustion engines, natural gas reciprocating internal combustion engines, and natural gas boilers; crematoriums; short-term projects; and spray booths, as well as MICR values for gasoline dispensing facilities. Information regarding the methodology used to develop these screening tables can be found in Appendix VI through XIII.

Step 8: Identify MAAF

Using the Consolidated Health Values Table³, identify the MAAF for the TAC.

Step 9: Identify CP Factor and REL

Using the Consolidated Health Values Table³, identify the CP and REL for the TAC.

Step 10: Identify MP Adjustment Factor

Using Attachment N, Tables 3.1 and 3.2, identify the MP adjustment factor for the TAC, if applicable.

The MP adjustment factors are to be used only in urban residential or worker exposure situations. Note that there are separate MP adjustment factors for worker (MP_W), resident (MP_R) and short-term ($MP_{R,ST}$ and $MP_{W,ST}$) exposure (see Attachment N, Tables 3.1 and 3.2) 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.

³ Available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

For a more detailed description of the derivation of the MP adjustment factors, please see Appendix II.

Step 11: Select CEF

Using Attachment N, Tables 4.1 A – 4.2 D, 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.

Step 12: Calculate WAF

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:

$$\text{WAF} = (\text{H}_{\text{residential}} / \text{H}_{\text{source}}) \times (\text{D}_{\text{residential}} / \text{D}_{\text{source}})$$

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 Guidelines allow the use of a discount factor (DF) when assessing inhalation cancer health impacts, if the off-site 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 TACs

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 over a 70-year exposure duration. 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 resulting MICR from a 30-year exposure duration is greater than one 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:

- Re-calculate total MICR from all TACs from a single permit unit using a 70-year exposure duration, as is required in the 2015 OEHHA Guidelines⁴. The CEF for the 70-year exposure duration can be found in Attachment N, Table 4.1 E.
- Estimate the distance at which the MICR from a 70-year exposure duration 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 Attachment N source specific tables.
- 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/km², but some areas are as high as 7,000 persons/km².

For areas where census data is available, it should be used. Where there is no census data, 7,000 persons/km² should be used for the areas with high population densities and 4,000 persons/km² should be used for areas with low population densities (such as locations along the Pacific Ocean). Where the population densities are unknown, use 7,000 persons/km².

- 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 χ/Q in the Attachment N source specific tables are not sufficient to estimate the distance at which MICR falls below one in one million, then a more refined risk assessment is warranted.

⁴ OEHHA, 2015. Section 8, "Risk Characterization for Carcinogens and Noncarcinogens and the Requirements for Hot Spots Risk Assessments." Available at: <https://oehha.ca.gov/media/downloads/crrn/2015guidancemanual.pdf>.

INSTRUCTIONS FOR CALCULATING 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 HIA, HIC8, and/or HIC 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).

The REL is used as an indicator of potential adverse non-cancer health effects. An inhalation REL is a concentration level ($\mu\text{g}/\text{m}^3$) at which no adverse health effects are anticipated. Inhalation RELs are provided in the Consolidated Health Values Table⁵.

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 HQs of all chemicals emitted that impact the same target organ, called total **Hazard Index (HI)**, is evaluated. The Target Organs Tables for each TAC are available on CARB's website⁶.

Detailed procedures for calculating the total HI are provided in the 2015 OEHHA Guidelines. The equations used to calculate the HIC, HIC8, and HIA per target organ are as follows:

$$\text{Total HIC}_{\text{target organ}} = \{[Q_{\text{tpy},\text{TAC1}} \times (\chi/Q) \times \text{MP}_{\text{TAC1}} \times \text{MwAF}]/\text{Chronic REL}_{\text{TAC1}}\}_{\text{target organ}} + \{[Q_{\text{tpy},\text{TAC2}} \times (\chi/Q) \times \text{MP}_{\text{TAC2}} \times \text{MwAF}]/\text{Chronic REL}_{\text{TAC2}}\}_{\text{target organ}} + \dots$$

$$\text{Total HIC8}_{\text{target organ}} = \{[Q_{\text{tpy},\text{TAC1}} \times (\chi/Q) \times \text{WAF} \times \text{MwAF}]/8\text{-Hour REL}_{\text{TAC1}}\}_{\text{target organ}} + \{[Q_{\text{tpy},\text{TAC2}} \times (\chi/Q) \times \text{WAF} \times \text{MwAF}]/8\text{-Hour REL}_{\text{TAC2}}\}_{\text{target organ}} + \dots$$

$$\text{Total HIA}_{\text{target organ}} = \{[Q_{\text{lbph},\text{TAC1}} \times (\chi/Q)_{\text{hr}} \times \text{MwAF}]/\text{Acute REL}_{\text{TAC1}}\}_{\text{target organ}} + \{[Q_{\text{lbph},\text{TAC2}} \times (\chi/Q)_{\text{hr}} \times \text{MwAF}]/\text{Acute REL}_{\text{TAC2}}\}_{\text{target organ}} + \dots$$

Note that the HIC is based upon an annual average emission per year whereas the HIA is based upon a maximum 1-hour emission level and the HIA does not use an 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 HIC8 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.

⁵ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

⁶ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

PROCEDURE FOR ALTERNATE HI LEVEL EXEMPTION

Rule 1401 provides an exemption from the HI 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 HIC and HIA 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 HI 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 HI 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 website at: <http://www.aqmd.gov/home/permits/risk-assessment>.

Tier 3 screening dispersion modeling should only be used for 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 Attachment N source specific tables and Appendices VII through XII.

To perform a Tier 3 analysis, the following is needed:

- Air dispersion modeling expertise;
- The most recently approved version of U.S. EPA's screening dispersion model AERSCREEN, which can be downloaded from www.epa.gov/scram; and
- Additional equipment information such as stack gas temperature, stack gas exit velocity or flow rate, stack inside diameter, and surface characteristics (albedo, Bowen ratio, and surface roughness) of the appropriate meteorological station (see Appendix VI, Table VI-1).

It should be noted that AERSCREEN estimates peak 1-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 1-hour concentration is estimated. The U.S. 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."⁷

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:

$$\text{MICR}_R = \text{CP} \times \text{PeakConc} \times \text{CEF}_R \times \text{MP}_R \times 10^{-6} \times \text{MWF}$$

$$\text{MICR}_W = \text{CP} \times \text{PeakConc} \times \text{CEF}_W \times \text{MP}_W \times \text{WAF} \times 10^{-6} \times \text{MWF}$$

$$\text{Total HIC}_{\text{target organ}} = \Sigma \{[\text{AveConc}_{\text{TAC}} \times \text{MP} \times \text{MWF}] / \text{Chronic REL}_{\text{TAC}}\}_{\text{target organ}}$$

$$\text{Total HIC}_8_{\text{target organ}} = \Sigma \{[\text{AveConc}_{\text{TAC}} \times \text{WAF} \times \text{MWF}] / 8\text{-Hour REL}_{\text{TAC}}\}_{\text{target organ}}$$

$$\text{Total HIA}_{\text{target organ}} = \Sigma \{[\text{PeakConc}_{\text{TAC}} \times \text{MWF}] / \text{Acute REL}_{\text{TAC}}\}_{\text{target organ}}$$

⁷ U.S. EPA, October 1992. Section 4.5.4, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised", EPA 454/R-92-019. Available at: https://www3.epa.gov/scram001/guidance/guide/EPA-454R-92-019_OCR.pdf.

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PeakConc is the peak 1-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 CARB which replaces the prior version of HARP and incorporates the information contained in the 2015 OEHHA Guidelines. The HARP 2 software and documentation can be obtained at <http://www.arb.ca.gov/toxics/harp/harp.htm>. The U.S. EPA's air quality dispersion model AERMOD is used by HARP 2 to estimate the concentration of pollutants in place of the previously used Industrial Source Complex - Short Term Version 3 (ISCST3) model. ISCST3 dispersion modeling will no longer be allowed for determining TAC concentrations. CARB recommends AERMOD for Hot Spots risk assessments. AERMOD documentation is available at: <https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#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 risks. Since Tier 4 involves detailed dispersion modeling using actual meteorological data from the station that is most representative of the facility's meteorological conditions, 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 used to develop the source specific tables in Attachment N, Tables 6.1 A – 13.3 and Appendices VII through XII, 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 dispersion modeling and risk assessment. In addition, SCAQMD modeling staff should be consulted and a modeling protocol be approved before performing a detailed risk assessment which deviates from SCAQMD's methodology. For guidance on performing a detailed risk assessment, refer to SCAQMD website at: <http://www.aqmd.gov/home/permits/risk-assessment>. AERMOD should be run using the averaging times PERIOD and 1-hour.

Written guidance on preparing a detailed risk assessment is contained in the 2015 OEHHA Guidelines 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>. HARP 2 settings should follow the options described in Appendix II. 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, and 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 October 1, 2017.

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 feet

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 based upon when the application was deemed complete. In this case, the tables for applications deemed complete on or after October 1, 2017 (i.e., Permit Application Package “N”) are used.

Second, calculate MICR for those TACs that have Inhalation CP Values from the Consolidated Health Values Table⁸. Note that the MICR calculated here is for a 30-year exposure duration. Table B below identifies the TACs and their corresponding Inhalation CP Values for MICR calculations.

⁸ Available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Table B

TAC	Inhalation (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 the Consolidated Health Values Table⁹, determine if the emitted pollutant has carcinogenic, HIC, HIC8, and/or HIA health values. The results are as follows:

Table C

TAC	MICR (cancer)	HIC (chronic)	HIC8 (chronic)	HIA (Acute)
Chromium 6+	√ (MP)	√ (MP)		

MP indicates that the adjustment factor will be different than 1.0. MP adjustment factors can be found in Attachment N, Tables 3.1 and 3.2.

Tier 1: Screening Emission Levels

The nearest receptor location, in this case the worker location of 100 meters, 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 Attachment N, Table 1.0 as appropriate. The annual emission rate for Chromium 6+ in Table 1.0 is 4.31E-04 pounds per year at a distance of 100 meters. No maximum hourly emissions are presented in Table 1.0 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 1.0. In this example, this facility did not pass Tier 1 since the annual emissions (2.30E-03 lb/yr) are greater than those presented in Table 1.0 (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 Q_{tpy}

According to Table A of the example, $Q_{tpy} = 1.15E-06$.

Step 2: Determine Release Type

⁹ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

The TAC is released from one piece of equipment fitted with control equipment and vented through a stack. 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 in the permit. 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 Appendix VI, Figure VI-1, the closest monitoring station is **Ontario International Airport (KONT)**.

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 Attachment N, Table 6.2 B for Ontario at a distance of 100 meters (**4.02**) and 150 meters (**2.78**) were used. The χ/Q value at 150 meters was interpolated between 100 meters and 200 meters.

Step 8: Identify MAAF

The MAAF value for Chromium 6+ (**1**) was found in the Consolidated Health Values Table¹⁰.

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 the Consolidated Health Values Table¹¹. 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 Attachment N, Tables 3.1 and 3.2.

¹⁰ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Step 11: Select CEF

The CEF values ($CEFR = 677.40$, $CEFW = 55.86$) for residential and worker exposures were found in Attachment N, Tables 4.1 D and 4.2 D.

Step 12: Calculate WAF

Since the point source operates 24 hours/day and 7 days/week, the WAF value (**1.0**) was found in Attachment N, Table 5.2.

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	$CEFW$	MP_w	WAF	MWAF	MICR
Chromium 6+	5.10E+02	1.15E-06	4.02	55.86	1.02	1	1	1.34E-07

(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	$CEFR$	MP_R	MWAF	MICR
Chromium 6+	5.10E+02	1.15E-06	2.78	677.40	1.60	1	1.77E-06

Please note that the higher of the worker and residential cancer risks needs to be selected. 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 1.77×10^{-6} , the cancer burden needs to be calculated.

Re-calculate the MICR using a 70-year exposure duration

Since cancer burden is based on a 70-year exposure period, and our previous MICR calculation was based on a 30-year exposure period, the MICR needs to be re-calculated. Using $CEFR = 766.78$ (Attachment N, Table 4.1 E), the new MICR ($MICR_{70}$) at the residential receptor is calculated to be 2.00×10^{-6} .

Estimate of distance at which $MICR_{70}$ falls below one in one million.

The distance at which the $MICR_{70}$ falls below one in one million requires you to take the reciprocal of the calculated $MICR_{70}$ multiplied by 1.0×10^{-6} . This factor (F) will be the multiplier to the χ/Q value used in determining the MICR.

$$F = (1 / MICR) \times 1.0 \times 10^{-6}$$

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$$F = (1 / 2.00 \times 10^{-6}) \times 1.0 \times 10^{-6}$$

$$F = 0.500$$

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,

$$\text{New } \chi/Q = 2.78 \times 0.500$$

$$\text{New } \chi/Q = 1.39$$

Using Attachment N, Table 6.2 B, the new χ/Q lies between downwind distances of 200 to 300 meters. Interpolating for the new downwind distance gives is 219 meters.

This new downwind distance is where the MICR will fall below one in one million.

Define Zone of Impact

The Zone of Impact is calculated using the new downwind distance as the radius of a circle and calculating the area of that circle.

Therefore,

$$\text{Zone of Impact} = 3.14 r^2$$

$$\text{Zone of Impact} = 3.14 (0.219 \text{ km})^2$$

$$\text{Zone of Impact} = 0.151 \text{ km}^2$$

Estimate the population within the Zone of Impact

The Zone of Impact 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/km² should be used for the areas with high population densities and 4,000 persons/km² should be used for areas with low population densities. Where the population densities are unknown, use 7,000 persons/km².

In this example we have no information on census data or population density, therefore,

$$\text{Zone of Impact Population} = \text{Zone of Impact} \times \text{Population Density}$$

$$\text{Zone of Impact Population} = 0.151 \text{ km}^2 \times 7,000 \text{ person/ km}^2$$

$$\text{Zone of Impact Population} = 1,055 \text{ persons}$$

Calculate Cancer Burden

For a screening level analysis, the cancer burden is estimated using the zone of impact population multiplied by the calculated MICR₇₀.

Therefore,

$$\text{Cancer Burden} = 910 \text{ persons} \times 2.00 \times 10^{-6}$$

Cancer Burden = 0.00211

HI Calculations

HIC, HIC8 and HIA should be calculated for each target organ. Since no HIA or HIC8 health values have been adopted for Chromium 6+, only the HIC is estimated.

HIC:

$$\text{HIC} = \Sigma [(Q_{\text{tpy}}) \times (\chi/Q)_{\text{chronic}} \times \text{MP} \times \text{MWAF}] / (\text{Chronic REL})$$

The HIC for the TAC in this example are calculated as follows:

Chromium 6+:

Worker: $\text{HIC} = [1.15\text{E-}06 \times 4.02 \times 1.00 \times 1] / (2.00\text{E-}01) = \mathbf{2.31\text{E-}05}$

Resident: $\text{HIC} = [1.15\text{E-}06 \times 2.78 \times 2.44 \times 1] / (2.00\text{E-}01) = \mathbf{3.90\text{E-}05}$

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	1.34E-07	2.31E-05	N/A	N/A
Resident	1.77E-06	3.90E-05	N/A	N/A
Rule 1401 Threshold	10E-06	1.0	1.0	1.0
Exceeds Threshold?	No	No	N/A	N/A

RESULT:

- *MICRs for residential and commercial receptors do not exceed 10E-06 (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 HIC8 or HIA 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, and HIA CALCULATIONS

An industrial operation generates arsenic, benzene, and dioxin emissions.

The application was deemed complete on October 1, 2017.

Volume source: Building dimensions 40 feet (W) x 70 feet (L) x 17 feet (H)

The nearest receptor distances are:

Worker (Industrial) = 328 feet (100 meters)

Residential = 1640 feet (500 meters)

Permitted Operating Schedule: 8 hours/day, 5 days/week, 50 weeks/year = 2,000 hours/year

Facility location: Azusa, CA

TACs: Arsenic, Benzene, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (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 _{lbyr} (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 October 1, 2017 (i.e., Permit Application Package “N”) are used.

Second, calculate MICR for those TACs that have Inhalation Cancer Potency Values from the Consolidated Health Values Table¹¹. Table B below identifies the TACs and their corresponding Inhalation Cancer Potency Values for MICR calculations.

¹¹ Available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Table B

TAC	Inhalation Cancer Potency (CP) (mg/kg-day)⁻¹
Arsenic	1.20E+01
Benzene	1.00E-01
Dioxin	1.30E+05
Nickel hydroxide	9.10E-01

Based on the above table, MICR will be evaluated for residential and worker receptors for arsenic, benzene, dioxin, and nickel hydroxide.

From the Consolidated Health Values Table¹², we can also determine if the emitted pollutant is carcinogenic, HIC, HIC8, and/or HIA. 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 adjustment factor will be different than 1.0. Multi-pathway factors can be found in Attachment N, Tables 3.1 and 3.2.

Next, for chronic and acute substances, review the Target Organs Tables¹² 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. Conservatively, it can be assumed that all TACs affect the same target organ, therefore, a breakdown of the affected target organ by TAC is not needed for the analysis.

¹² Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

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Table C (Chronic Toxicity)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			√	√						√	√	√
Benzene							√					
Dioxin	√			√	√		√				√	
Nickel hydroxide				√			√				√	

AL: Alimentary system (liver)
 BN: Bones and teeth
 CV: Cardiovascular system
 REP/DEV: Reproductive/Developmental
 END: Endocrine system
 EYE: Eye

HEM: Hematopoietic system
 IMM: Immune system
 KID: Kidney
 NS: Nervous system
 RESP: Respiratory system
 SKIN: Skin

Table D (Chronic 8-hour Toxicity)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			√	√						√	√	√
Benzene							√					
Dioxin												
Nickel hydroxide								√			√	

Table E (Acute Toxicity)

TAC	AL	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic		√	√						√		
Benzene			√			√	√				
Dioxin											
Nickel hydroxide							√				

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Tier 1: Screening Emission Levels

The nearest receptor location, in this case the worker location of 100 meters, 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 Attachment N, Table 1.0 and are expressed in lb/yr.

Sum up the individual Pollutant Screening Indices for each pollutant (Σ PSI_P).

TAC	Q _{lbpy,P}	PSL _P	PSI _P
Arsenic	1.66E-02	3.81E-03	4.36
Benzene	1.50E+01	4.44E+00	3.38
Dioxin	1.22E-06	1.33E-07	9.17
Nickel hydroxide	4.60E+00	1.92E-01	23.96
		Σ PSI_P =	40.87

Calculate the Application Screening Index (ASI).

$$ASI_{\text{cancer and/or chronic}} = \Sigma PSI_P = 40.87$$

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 Attachment N, Table 1.0 and are expressed in lb/hr.

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Sum up the individual pollutant screening indices for each acute pollutant ($\sum \text{PSI}_P$).

TAC	$Q_{\text{lbph,P}}$	PSL_P	PSI_P
Arsenic	8.30E-06	2.76E-04	0.03
Benzene	7.50E-03	3.73E-02	0.20
Nickel hydroxide	2.30E-03	4.36E-04	5.28
$\sum \text{PSI}_P =$			5.51

Calculate the Application Screening Index (ASI).

$$\text{ASI}_{\text{acute}} = \sum \text{PSI}_P = 5.51$$

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 1 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 feet x 70 feet (2,800 ft² 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 Appendix VI, Figure VI-1, the closest monitoring station is **Azusa (AZUS)**.

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 ft² and height of 17 feet operates less than 12 hours/day, the χ/Q values from Attachment N, Table 7.1 A for Azusa at a distance of 100 meters (**0.84**) and 500 meters (**0.05**) were used.

Step 8: Identify MWAF

The MWAF values for all TACs were found in the Consolidated Health Values Table¹³.

Step 9: Identify CP and REL

The CP values and chronic REL values for all TACs were found in the Consolidated Health Values Table¹².

Step 10: Identify MP

The MP values for all TACs were found in Attachment N, Tables 3.1 and 3.2.

Step 11: Select CEF

The CEF values (**CEFR = 677.40**, **CEFW = 55.86**) for residential and worker exposures were found in Attachment N, Tables 4.1 D and 4.2 D.

Step 12: Calculate WAF

Since the volume source operates 8 hours/day and 5 days/week, the WAF value (**4.2**) was found in Attachment N, Table 5.1.

¹³ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

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MICR Calculation

(1) Worker: $MICR_w = CP \times Q_{tpy} \times \chi/Q \times CEF_w \times MP_w \times WAF \times 10^{-6} \times MWF$

TAC	CP	Q _{tpy}	χ/Q	CEF _w	MP _w	WAF	MWAF	MICR
Arsenic	1.20E+01	8.30E-06	0.84	55.86	4.52	4.2	1	8.87E-08
Benzene	1.00E-01	7.50E-03	0.84	55.86	1.00	4.2	1	1.48E-07
Dioxin	1.30E+05	6.10E-10	0.84	55.86	7.58	4.2	1	1.18E-07
Nickel hydroxide	9.10E-01	2.30E-03	0.84	55.86	1.00	4.2	0.6332	2.61E-07
TOTAL								6.16E-07

(2) Resident: $MICR_R = CP \times Q_{tpy} \times \chi/Q \times CEF_R \times MP_R \times 10^{-6} \times MWF$

TAC	CP	Q _{tpy}	χ/Q	CEF _R	MP _R	MWAF	MICR
Arsenic	1.20E+01	8.30E-06	0.05	677.40	9.71	1	3.28E-08
Benzene	1.00E-01	7.50E-03	0.05	677.40	1.00	1	2.54E-08
Dioxin	1.30E+05	6.10E-10	0.05	677.40	25.72	1	6.91E-08
Nickel hydroxide	9.10E-01	2.30E-03	0.05	677.40	1.00	0.6332	4.49E-08
TOTAL							1.72E-07

Please note that the higher of the worker and residential cancer risks needs to be selected. 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.

HI Calculations

HIC, HIC8, and HIA should be calculated for each target organ. Conservatively, it can be assumed that all TACs affect the same target organ to calculate the worst-case HI.

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HIC:

Worker: $HIC_W = \sum [(Q_{tpy}) \times (\chi/Q)_{chronic} \times MP_W \times MWAF] / (\text{Chronic REL})$

Resident: $HIC_R = \sum [(Q_{tpy}) \times (\chi/Q)_{chronic} \times MP_R \times MWAF] / (\text{Chronic REL})$

Based on the Target Organs Tables¹⁴, 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: $HIC_W = [8.30E-06 \times 0.84 \times 28.37 \times 1] / (1.50E-02) = \mathbf{1.32E-02}$

$HIC_R = [8.30E-06 \times 0.05 \times 88.03 \times 1] / (1.50E-02) = \mathbf{2.44E-03}$

Benzene: $HIC_W = [7.50E-03 \times 0.84 \times 1.00 \times 1] / (3.00E+00) = \mathbf{2.10E-03}$

$HIC_R = [7.50E-03 \times 0.05 \times 1.00 \times 1] / (3.00E+00) = \mathbf{1.25E-04}$

Dioxin: $HIC_W = [6.10E-10 \times 0.84 \times 307.60 \times 1] / (4.00E-05) = \mathbf{8.62E-05}$

$HIC_R = [6.10E-10 \times 0.05 \times 6.73 \times 1] / (4.00E-05) = \mathbf{2.35E-04}$

Nickel hydroxide: $HIC_W = [2.30E-03 \times 0.84 \times 1.00 \times 0.6332] / (1.40E-02) = \mathbf{8.74E-02}$

$HIC_R = [2.30E-03 \times 0.05 \times 1.00 \times 0.6332] / (1.40E-02) = \mathbf{5.20E-03}$

8. Worker: HIC_W (summed across each target organ)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			1.32E-02	1.32E-02						1.32E-02	1.32E-02	1.32E-02
Benzene							2.10E-03					
Dioxin	8.62E-05			8.62E-05	8.62E-05		8.62E-05				8.62E-05	
Nickel hydroxide				8.74E-02			8.74E-02				8.74E-02	
TOTAL	8.62E-05		1.32E-02	1.01E-01	8.62E-05		8.96E-02			1.32E-02	1.01E-01	1.32E-02

(2) Resident: HIC_R (summed across each target organ)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			2.44E-03	2.44E-03						2.44E-03	2.44E-03	2.44E-03
Benzene							1.25E-04					
Dioxin	2.35E-04			2.35E-04	2.35E-04		2.35E-04				2.35E-04	
Nickel hydroxide				5.20E-03			5.20E-03				5.20E-03	
TOTAL	2.35E-04		2.44E-03	7.87E-03	2.35E-04		5.56E-03			2.44E-03	7.87E-03	2.44E-03

¹⁴ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

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HIC8:

Worker: $HIC8_W = \Sigma [(Q_{tpy}) \times (\chi/Q)_{chronic} \times WAF \times MWAF] / (8\text{-hour Chronic REL})$

Resident: $HIC8_R = \Sigma [(Q_{tpy}) \times (\chi/Q)_{chronic} \times MWAF] / (8\text{-hour Chronic REL})$

Based on the Target Organs Table¹⁵, the target organs for the TACs with HIC8 RELs have been listed in Table D. The HIC8 for the TACs in this example are calculated as follows:

Arsenic: $HIC8_W = [8.30E-06 \times 0.84 \times 4.2 \times 1] / (1.50E-02) = 1.95E-03$

$HIC8_R = [8.30E-06 \times 0.05 \times 1] / (1.50E-02) = 2.77E-05$

Benzene: $HIC8_W = [7.50E-03 \times 0.84 \times 4.2 \times 1] / (3.00E+00) = 8.82E-03$

$HIC8_R = [7.50E-03 \times 0.05 \times 1] / (3.00E+00) = 1.25E-04$

Dioxin: **There are no HIC8 REL values established for dioxin.**

Nickel hydroxide: $HIC8_W = [2.30E-03 \times 0.84 \times 4.2 \times 0.6332] / (6.00E-02) = 8.56E-02$

$HIC8_R = [2.30E-03 \times 0.05 \times 0.6332] / (6.00E-02) = 1.21E-03$

9. Worker: HIC8_w (summed across each target organ)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			1.95E-03	1.95E-03						1.95E-03	1.95E-03	1.95E-03
Benzene							8.82E-03					
Dioxin												
Nickel hydroxide								8.56E-02			8.56E-02	
TOTAL			1.95E-03	1.95E-03			8.82E-03	8.56E-02		1.95E-03	8.76E-02	1.95E-03

(2) Resident: HIC8_R (summed across each target organ)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			2.77E-05	2.77E-05						2.77E-05	2.77E-05	2.77E-05
Benzene							1.25E-04					
Dioxin												
Nickel hydroxide								1.21E-03			1.21E-03	
TOTAL			2.77E-05	2.77E-05			1.25E-04	1.21E-03		2.77E-05	1.24E-03	2.77E-05

¹⁵ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

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HIA:

For all acute compounds with RELs developed for a 1-hour averaging period, the HIA are estimated using the equation below:

$$\text{Worker \& Resident: HIA} = [Q_{\text{lbph}} \times (\chi/Q)_{\text{lbhr}} \times \text{MWF}] / (\text{Acute REL})$$

Based on the Target Organs Tables¹⁶, the target organs for the TACs have been listed in Table E. The χ/Q values were taken from Attachment N, Table 7.7.

Note: The χ/Q values in Table 7.7 are based upon the maximum hourly emission rates.

Arsenic: $\text{HIA}_W = [8.30\text{E-}06 \times 107.4 \times 1] / (2.00\text{E-}01) = \mathbf{4.5\text{E-}03}$

$\text{HIA}_R = [8.30\text{E-}06 \times 10.44 \times 1] / (2.00\text{E-}01) = \mathbf{4.3\text{E-}04}$

Benzene: $\text{HIA}_W = [7.50\text{E-}03 \times 107.4 \times 1] / (2.70\text{E+}01) = \mathbf{3.0\text{E-}02}$

$\text{HIA}_R = [7.50\text{E-}03 \times 10.44 \times 1] / (2.70\text{E+}01) = \mathbf{2.9\text{E-}03}$

Dioxin: **There are no HIA REL values established for dioxin.**

Nickel hydroxide: $\text{HIA}_W = [2.30\text{E-}03 \times 107.4 \times 0.6332] / (2.00\text{E-}01) = \mathbf{7.8\text{E-}01}$

$\text{HIA}_R = [2.30\text{E-}03 \times 10.44 \times 0.6332] / (2.00\text{E-}01) = \mathbf{7.6\text{E-}02}$

(1) Worker: HIA_W (summed across each target organ)

TAC	AL	CV	REP/ DEV	EYE	HEM	IMM	NS	RESP	SKIN
Arsenic		5.61E-03	5.61E-03				5.61E-03		
Benzene			3.75E-02		3.75E-02	3.75E-02			
Dioxin									
Nickel hydroxide						9.84E-01			
TOTAL		5.61E-03	4.31E-02		3.75E-02	1.02E+00	5.61E-03		

¹⁶ Available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

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(2) Resident: HIA_R (summed across each target organ)

TAC	AL	CV	REP/ DEV	EYE	HEM	IMM	NS	RESP	SKIN
Arsenic		4.15E-04	4.15E-04				4.15E-04		
Benzene			2.78E-03		2.78E-03	2.78E-03			
Dioxin									
Nickel hydroxide						7.29E-02			
TOTAL		4.15E-04	3.20E-03		2.78E-03	7.57E-02	4.15E-04		

Summary of Results

	MICR	HIC	HIC8	HIA
Worker	6.16 x 10 ⁻⁷	1.01E-01	8.76E-02	1.02E+00
Resident	1.72 x 10 ⁻⁷	7.87E-03	1.24E-03	7.57E-02
Rule 1401 Threshold	1.0 x 10 ⁻⁶	1.0	1.0	1.0
Exceeds Threshold?	No	No	No	Yes

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 and HIC8 for residential and off-site worker receptors, and HIA for residential receptors are less than 1.0 for all organ systems.
- HIA for off-site worker receptors is greater than 1.0 for all organ systems.

The equipment in this example does not contain T-BACT; therefore, it would pass the Rule 1401 limits for all but acute. A Tier 3 or 4 analysis is required for the HIA.

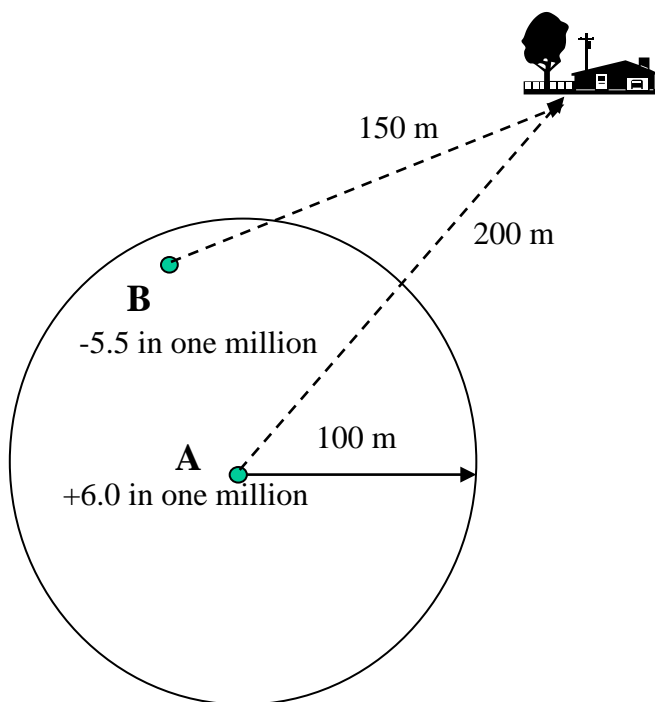
EXAMPLE 3: CONTEMPORANEOUS RISK REDUCTION

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 (1.0×10^{-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.

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Receptor R1: The increased risk for Receptor R1 is the MICR for Unit A less the decrease in risk for Unit B.

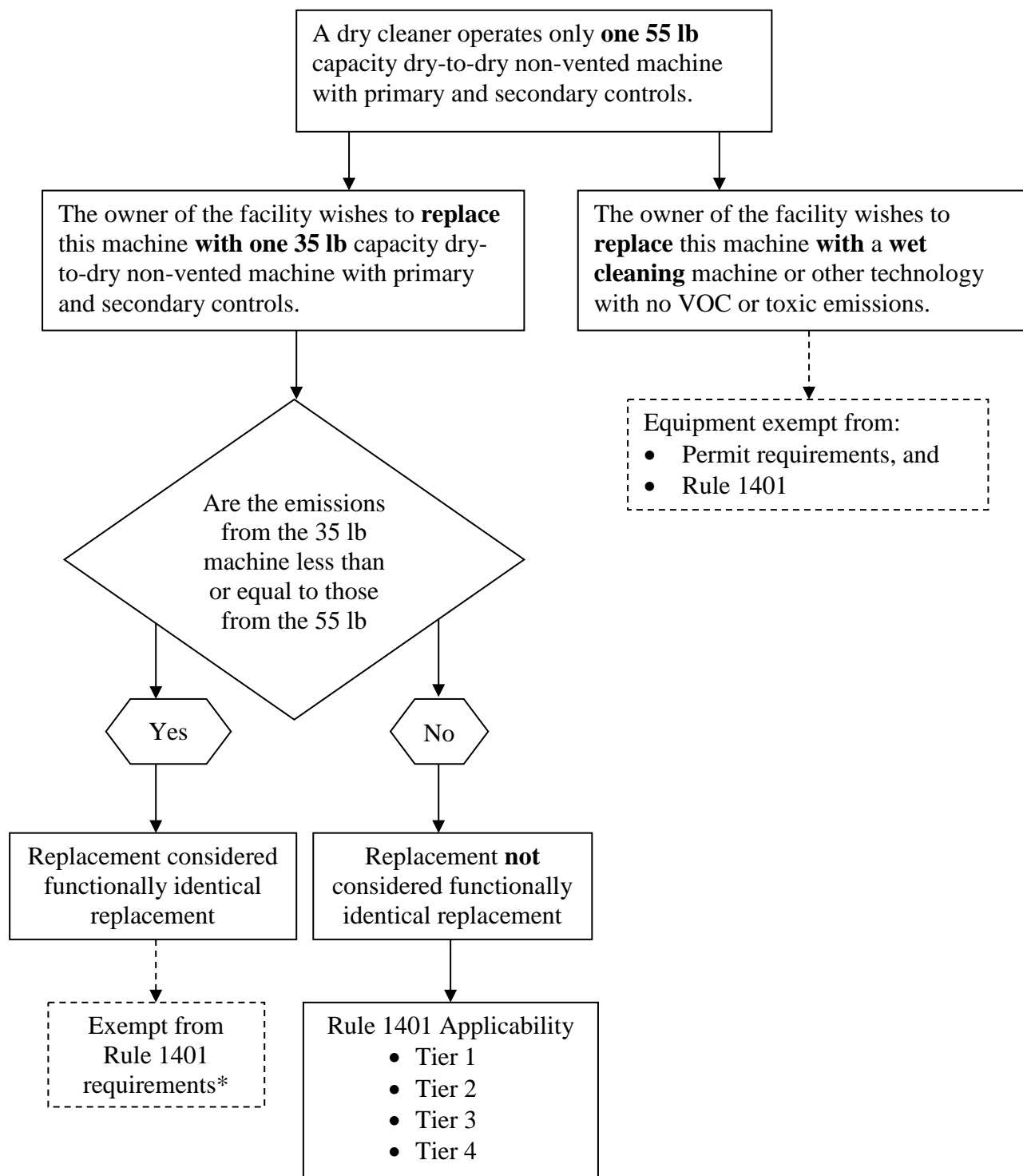
$$6.0 - 5.5 = \mathbf{0.5 \text{ in one million.}}$$

Note: This demonstration 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

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 ten in one 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

<i>Type of Industry:</i>	<i>Wood Finishing</i>
<i>Type of Emitting Process:</i>	<i>Wood Coatings</i>
<i>Specific TAC Emissions:</i>	<i>Ethylbenzene, Formaldehyde</i>
<i>Applicable BACT:</i>	<i>Thermal Oxidizer</i>
<i>T-BACT:</i>	<i>Thermal Oxidizer</i>

BACT = T-BACT

With T-BACT, risk is ten in one million or less

T-BACT is acceptable

<i>Type of Industry:</i>	<i>Metal Plating</i>
<i>Type of Emitting Process:</i>	<i>Nickel Plating, Chromium Plating</i>
<i>Specific TAC Emissions:</i>	<i>Nickel, Hexavalent chromium</i>
<i>Applicable BACT:</i>	<i>Wet Scrubber</i>
<i>T-BACT:</i>	<i>HEPA</i>

With T-BACT, risk is 10 in one million or less

T-BACT is acceptable

APPENDIX I

CALCULATION WORKSHEETS

MICR Calculation Worksheet
HIA Calculation Worksheet
HIC Calculation Worksheet
HIC8 Calculation Worksheet

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RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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 _{lppy} (lb/yr)	Maximum Annual Emissions, Q _{tpy} (ton/yr)	CP (Table 8.1)	MICR MP (Att. N, Table)	
				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:** _____ ft²

Distance to nearest residential or sensitive receptor: _____ m &

Off-site worker receptor: _____ m

Nearest **SCAQMD meteorological station:** _____ (Appendix VI, Figure VI-1 & Table VI-1)

Select χ/Q and **WAF Tables** as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Att. N, Tables 6.1 A, 6.2 A, 6.3 A	Att. N, Tables 7.1 A, 7.2 A, 7.3 A, 7.4 A, 7.5 A, 7.6 A
> 12 hr/day	Att. N, Tables 6.1 B, 6.2 B, 6.3 B	Att. N, Tables 7.1 B, 7.2 B, 7.3 B, 7.4 B, 7.5 B, 7.6 B

Select **CP** and **MP** from Attachment N, Table 3.1 and the Consolidated Health Values Table found at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

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: 677.40

for nearest off-site worker receptor: 55.86

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 = _____

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HIC CALCULATION WORKSHEET

Target Organ/System*: (Target Organs Tables are available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.)

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:** _____ ft²

Distance to **nearest residential or sensitive receptor:** _____ meters

Distance to **nearest off-site worker receptor:** _____ meters

Nearest **SCAQMD meteorological station:** _____ (Appendix VI, Figure VI-1 & Table VI-1)

Select χ/Q as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Att. N, Tables 6.1 A, 6.2 A, 6.3 A	Att. N, Tables 7.1 A, 7.2 A, 7.3 A, 7.4 A, 7.5 A, 7.6 A
> 12 hr/day	Att. N, Tables 6.1 B, 6.2 B, 6.3 B	Att. N, Tables 7.1 B, 7.2 B, 7.3 B, 7.4 B, 7.5 B, 7.6 B

Select **Chronic REL** and **Chronic MP** from Attachment N, Table 3.2 and the Consolidated Health Values Table, found at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q _{lbyr} (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.					

HIC CALCULATION:

$\Sigma [(Q_{tpy}) \times (\chi/Q) \times MP] / (\text{Chronic REL})$ 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.

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HIC8 CALCULATION WORKSHEET

Target Organ/System*: (Target Organs Tables are available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.)

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:** _____ ft²

Distance to **nearest residential or sensitive receptor:** _____ meters

Distance to **nearest off-site worker receptor:** _____ meters

Nearest **SCAQMD meteorological station:** _____ (Appendix VI, Figure VI-1 & Table VI-1)

Select χ/Q as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Att. N, Tables 6.1 A, 6.2 A, 6.3 A	Att. N, Tables 7.1 A, 7.2 A, 7.3 A, 7.4 A, 7.5 A, 7.6 A
> 12 hr/day	Att. N, Tables 6.1 B, 6.2 B, 6.3 B	Att. N, Tables 7.1 B, 7.2 B, 7.3 B, 7.4 B, 7.5 B, 7.6 B

Select **8-Hour Chronic REL** from the **Consolidated Health Values Table** found at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>; and **WAF** from Attachment N, Tables 5.1 or 5.2 for **off-site worker receptor only**

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q _{lbyr} (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.					

HIC8 CALCULATION:

$\Sigma [(Q_{tpy}) \times (\chi/Q) \times WAF] / (8\text{-Hour Chronic REL})$ 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.

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HIA CALCULATION WORKSHEET

Target Organ/System*: (Target Organs Tables are available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.)

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:** _____ ft²

Distance to **nearest residential or sensitive receptor:** _____ meters

Distance to **nearest off-site worker receptor:** _____ meters

Nearest **SCAQMD meteorological station:** _____ (Appendix VI, Figure VI-1 & Table VI-1)

Select χ/Q : _____

Select χ/Q : from Attachment N, Table 6.4 if Point Source or from Attachment N, Table 7.7 if Volume Source

Select **Acute REL** from the Consolidated Health Values Table found at

<https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

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.			

HIA CALCULATION:

$[Q_{lbph} \times (\chi/Q)] / (\text{Acute REL})$

	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 MP ADJUSTMENT FACTORS

INTRODUCTION

Toxic air contaminants (TACs) 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, MP adjustment factors were developed. The inhalation risk is multiplied by the MP adjustment factors to account for the additional health risk due to other pathways of exposure.

The MP adjustment 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 adjustment 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 non-cancer 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 ≤ 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 MP adjustment 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 2015 OEHHA Guidelines). PCB 126 (‘,3’,‘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

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speciated PCB data, or other justification is available, different MP adjustment factors can be used subject to SCAQMD approval.

APPENDIX III

**PROCEDURES FOR ADDRESSING NON-DETECTED COMPOUNDS
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 (AB2588 Program). Procedures are the same for preparing risk assessments for Rules 1401, 1402 and the AB2588 Program, however the lists of compounds are different. Rule 1401 uses only cancer potency factors (CP) 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 the AB2588 Program 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 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 AB2588 Program, as approved by SCAQMD staff.
2. The Joint Emissions Inventory Program (JEIP) identified and selected compounds under SCAQMD Rule 1179 – Publicly Owned Treatment Works Operations 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 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.

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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.

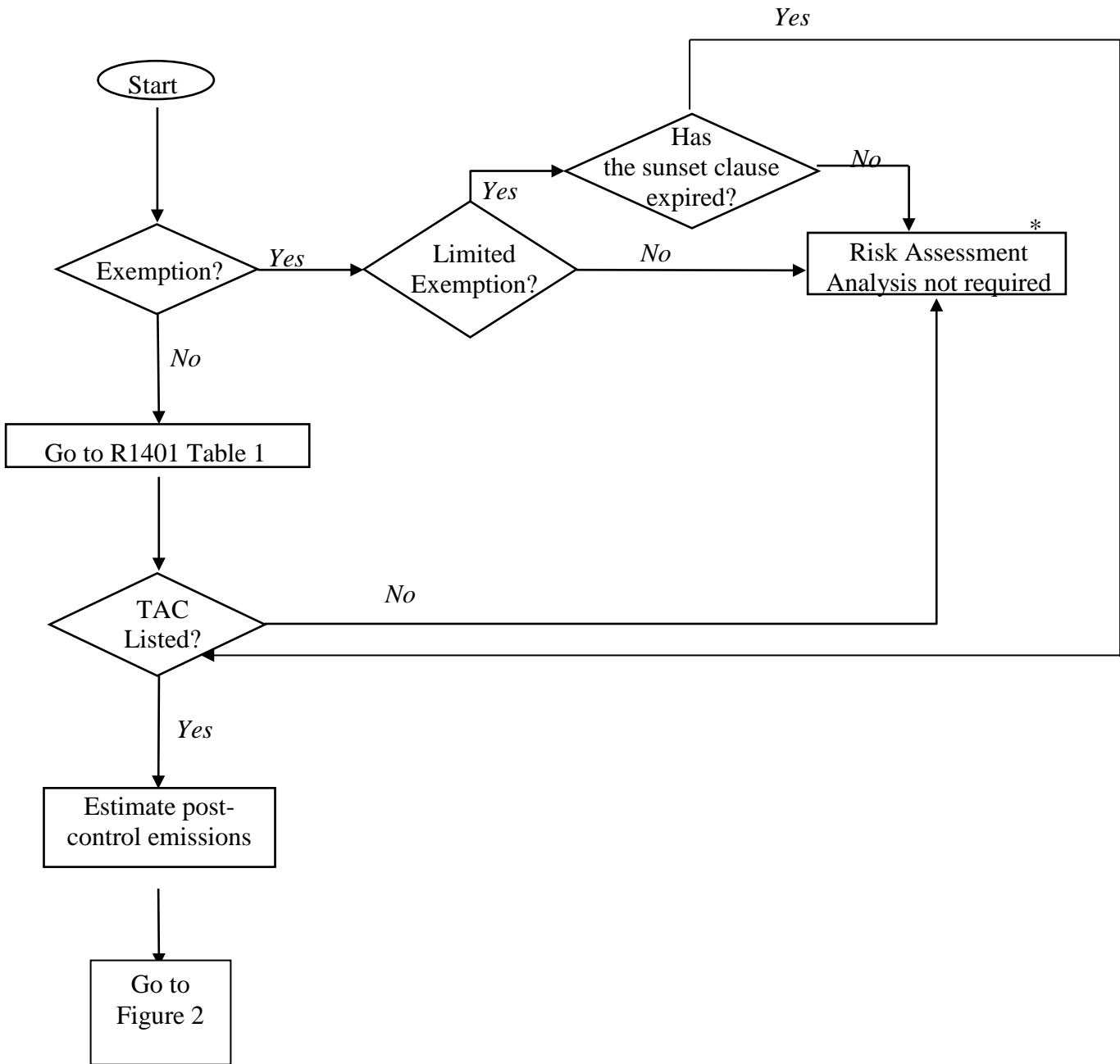
If the level of the TAC in the reagent blank is less than or equal to the maximum allowable blank, the reagent blank may be subtracted. The data must be reported with and without the correction. If the level of the TAC in the reagent blank is greater than the maximum allowable blank and the concentration of the sample is greater than three 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 Attachment N, Table 1.0, 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

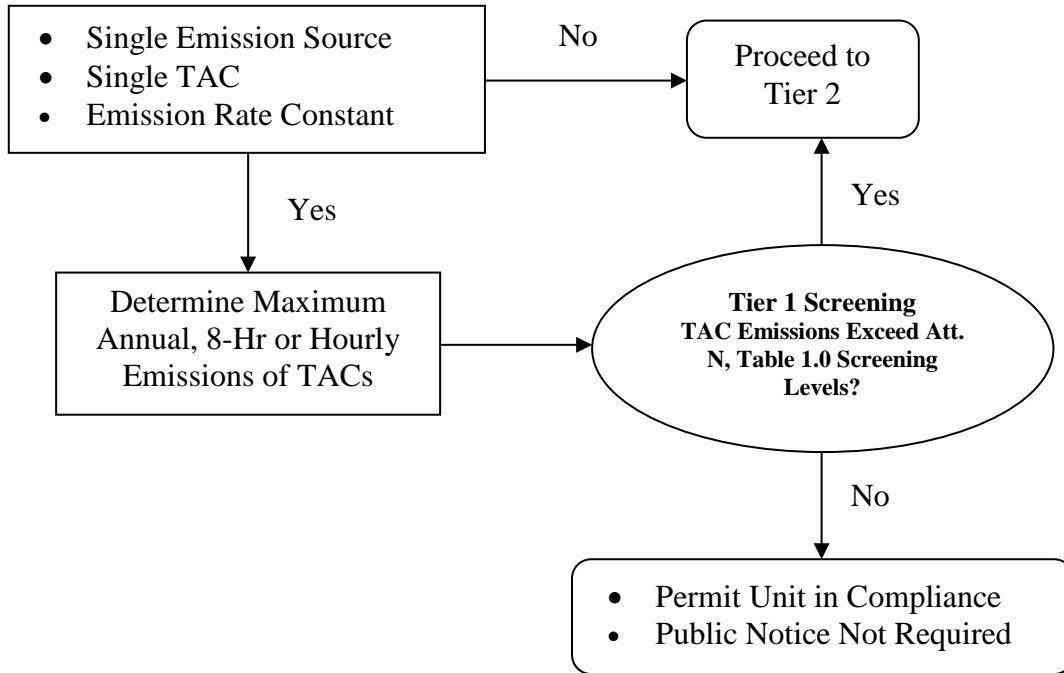
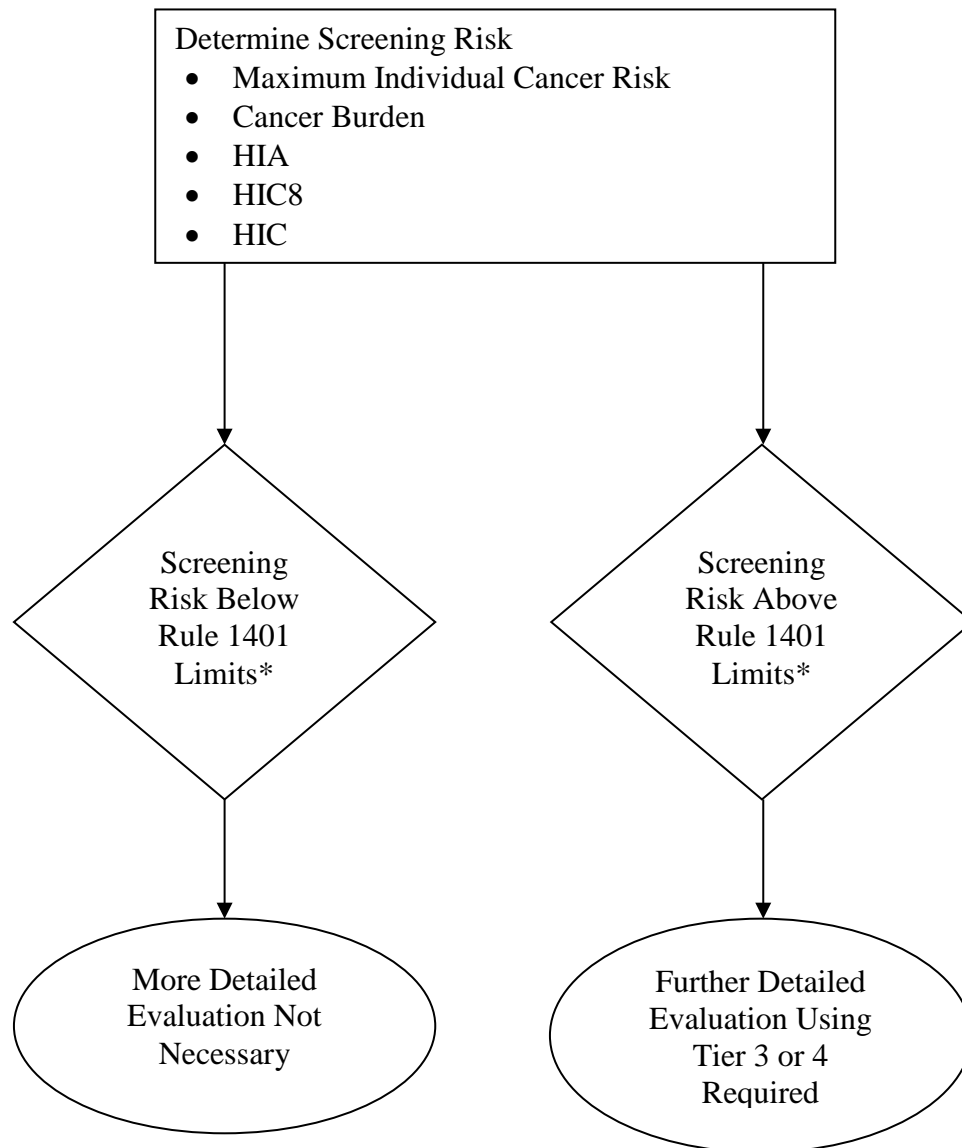


Figure 3A
Tier 2 - Screening Levels

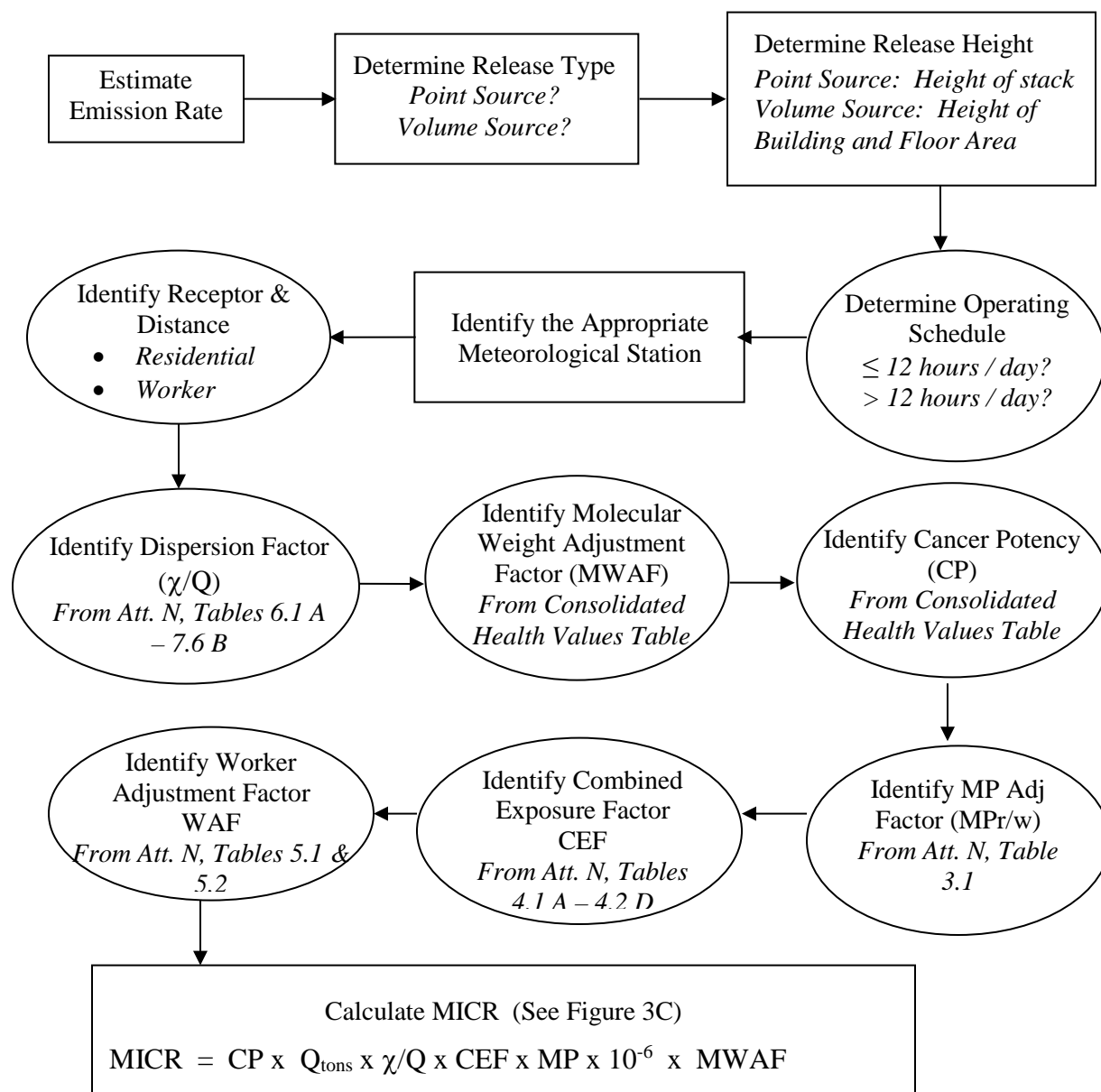
Tier 2 is a screening risk assessment, which includes procedures for determining level of risk from MICR, Cancer Burden, HIA, HIC8 & HIC



* *Level of Concern:*

- *MICR exceeds one in one million with no T-BACT*
- *MICR exceeds ten 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 - MICR Calculation



*If MICR exceeds one in one million, cancer burden must also be estimated.
 (See Figure 4.)*

Note that the Consolidated Health Values Table is available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Figure 3C
 Tier 2 - MICR Equation

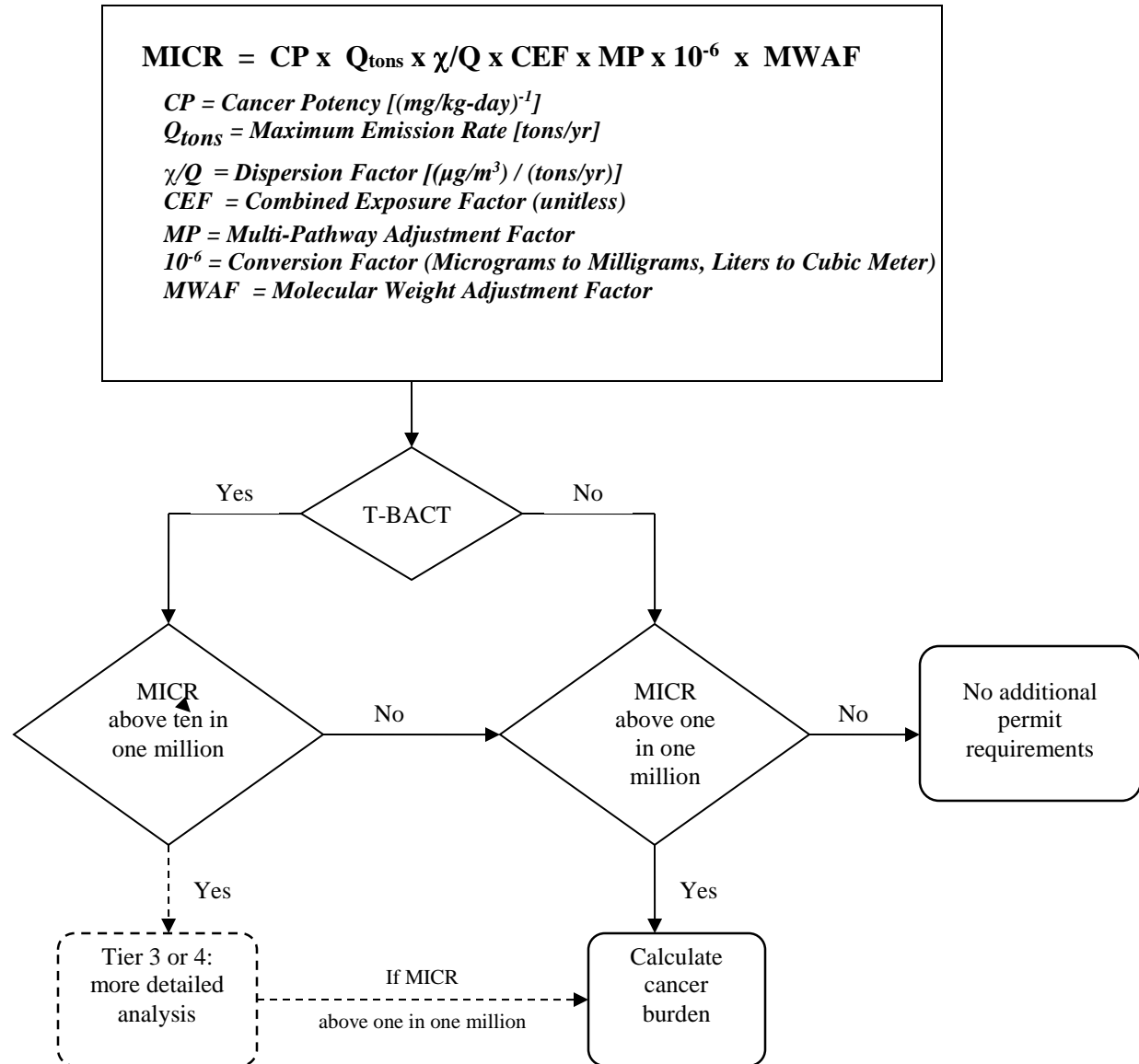


Figure 3D
Tier 2 - χ/Q

(χ/Q): Numerical estimates of the amount of decrease in concentration of a contaminant as it travels away from the site of release.

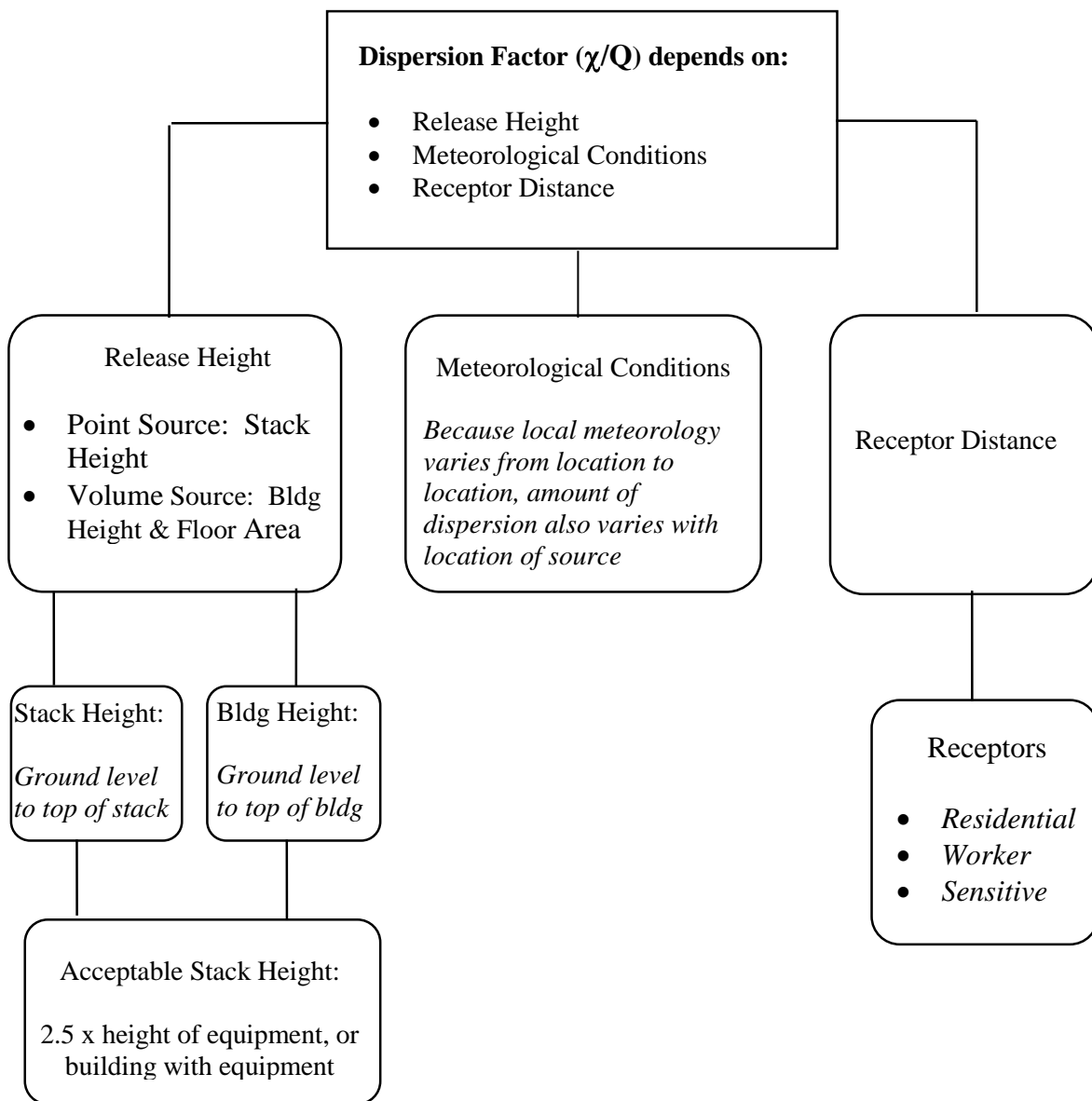


Figure 3E
Tier 2 - MP Adjustment Factor

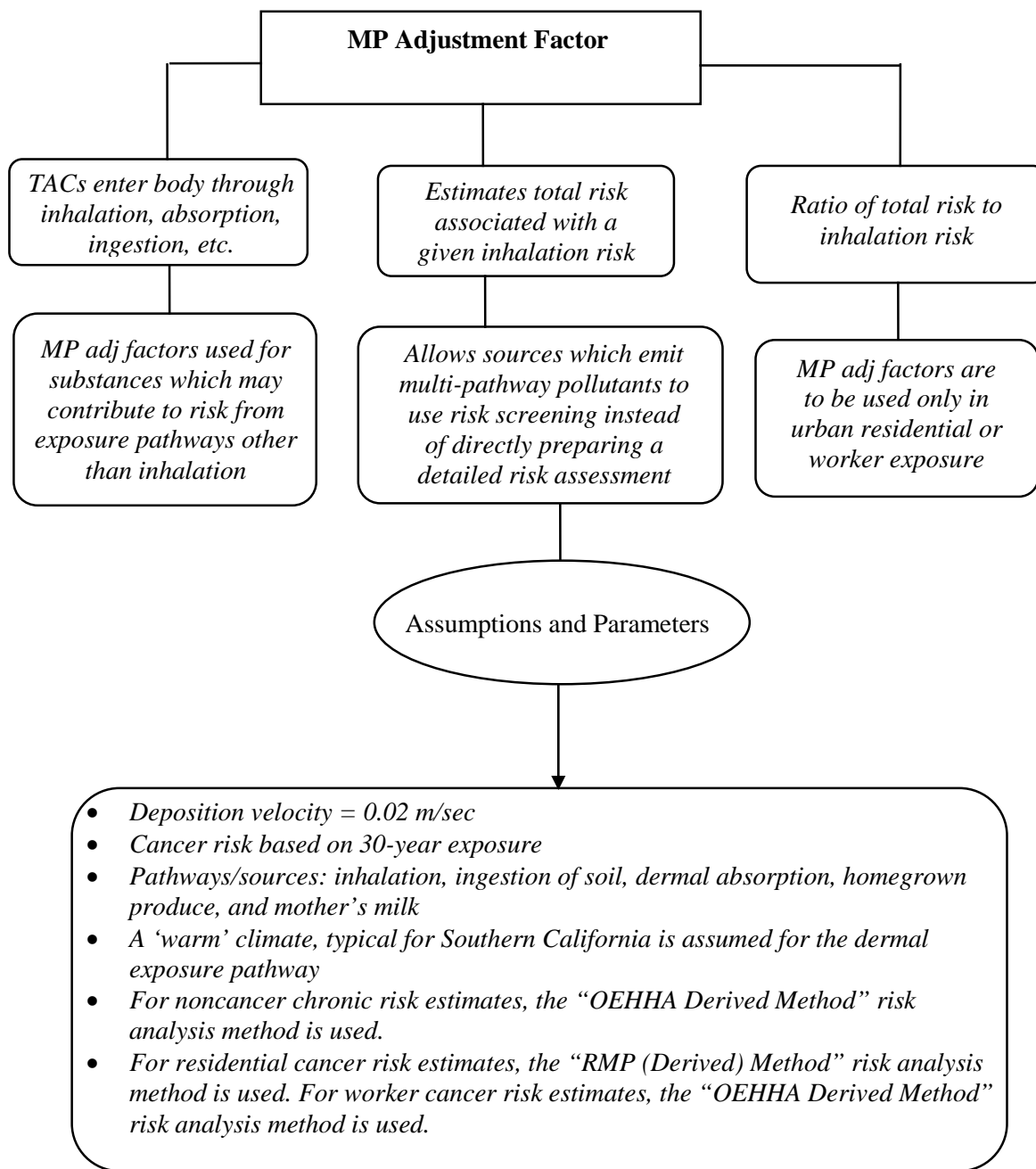


Figure 3F
Tier-2 - CEF

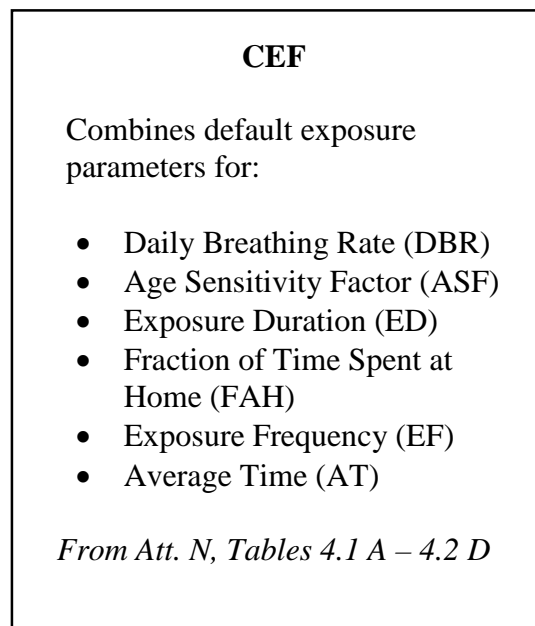


Figure 4
Cancer Burden

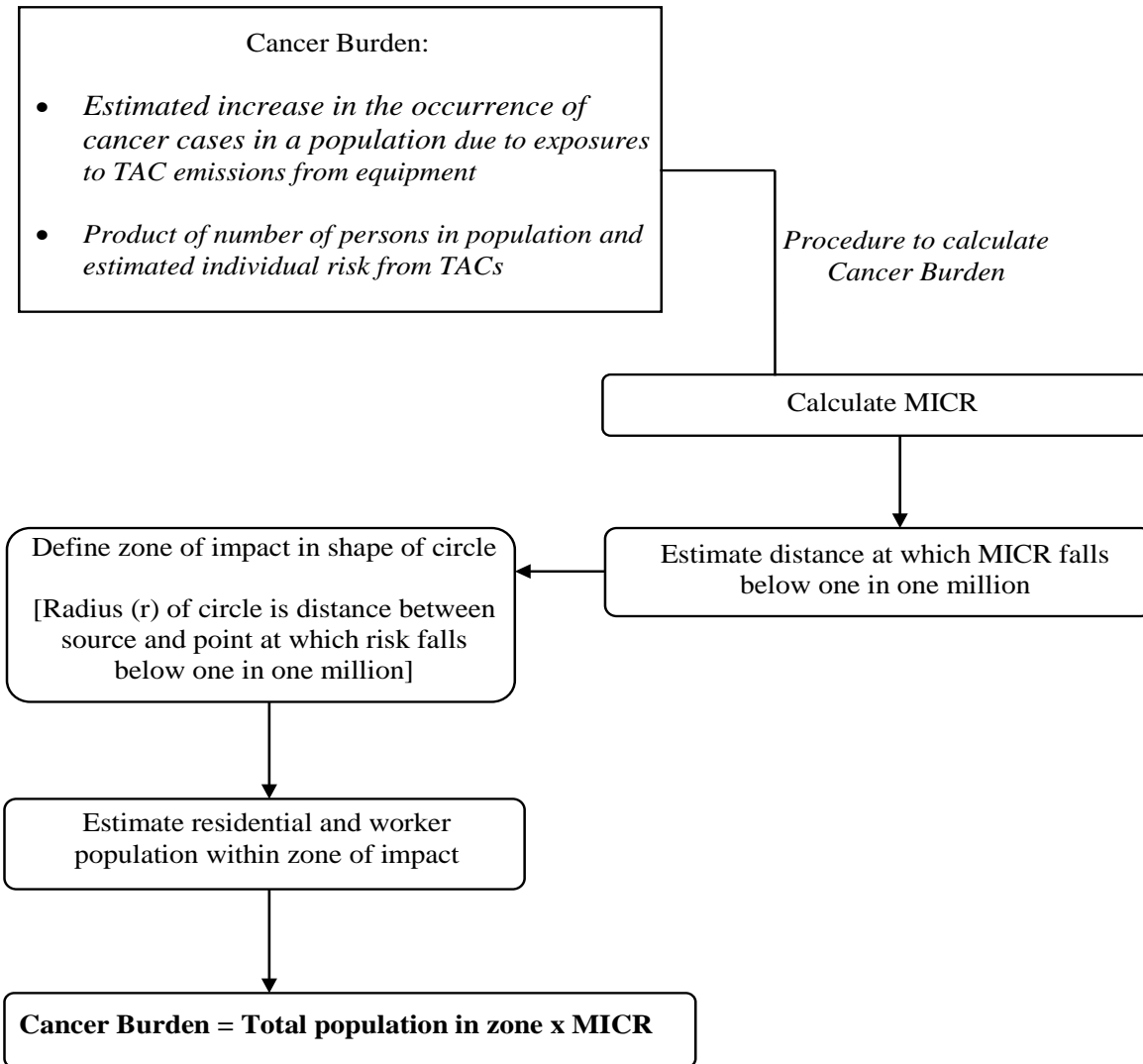
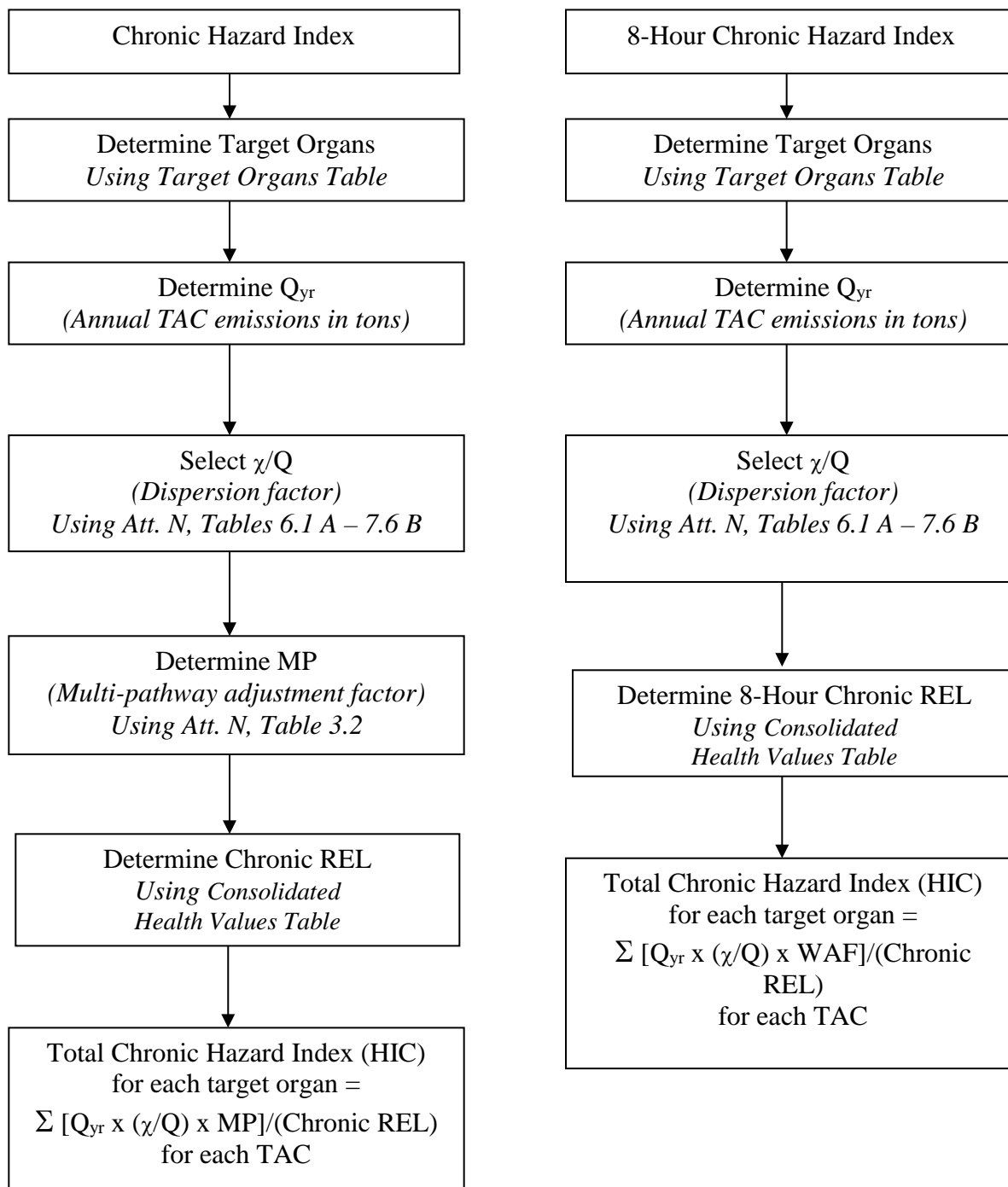
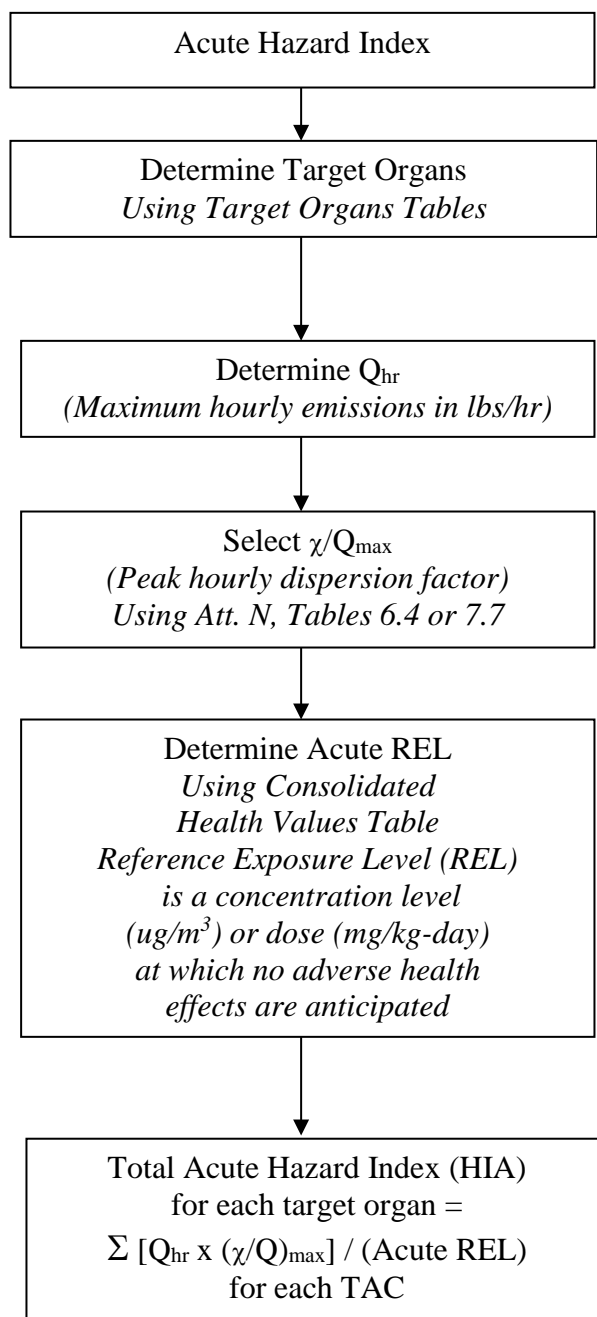


Figure 5
 HIC and HIC8



Note that the Consolidated Health Values Table is available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf> and the Target Organs Tables are available on CARB’s website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

Figure 6
HIA



Note that the Consolidated Health Values Table is available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/contable.pdf> and the Target Organs Tables are available on CARB's website at <https://www.arb.ca.gov/toxics/healthval/totables.pdf>.

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.

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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 (1.0×10^{-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

AIR QUALITY DISPERSION MODELING METHODOLOGY AND METEOROLOGICAL STATIONS/DATA

Introduction

This appendix discusses the general modeling methodologies used in the development of the screening tables contained in SCAQMD's Risk Assessment Procedures for Rule 1401 and 212 (Version 8.1) and *Attachment N*. Information on the meteorological data used in the analyses and how the data was processed are also included in the discussion below. The meteorological data is available on SCAQMD's website¹ for use in Tier 4 health risk assessments.

Air Quality Dispersion Modeling Methodology

Air quality modeling was performed using the air quality dispersion model AERMOD. As of December 9, 2006, U.S. EPA promulgated AERMOD as a replacement for ISCST3 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.

Air quality dispersion modeling performed for the development of the screening tables in Attachment N used U.S. EPA's most recent approved version of AERMOD, which is version 16216r. AERMOD was executed using the urban option, which is SCAQMD policy for all permitting in its jurisdiction. The U.S. EPA regulatory non-default option of flat terrain was implemented and the SCAQMD's AERMOD-ready meteorological data was used. The County populations used are based on the 2010 estimates from the U.S. Census Bureau. The Los Angeles County population was 9,818,605; Orange County population was 3,010,232; Riverside County population was 2,189,641; and San Bernardino County population was 2,035,210.

For all modeling performed, a polar receptor grid was utilized with 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 are used to develop the screening risk tables.

For all modeling that included building downwash effects as part of the analysis, the U.S. EPA's Building Profile Input Program for PRIME (BPIP-PRIME) version 04274 was used. BPIP-PRIME calculates downwash values that are used as input for models like AERMOD. The AERMOD modeling system (including all associated processors) is available on the U.S. EPA's website².

For more information regarding the modeling parameters and assumptions used to develop the screening tables for each specific category, please refer to the applicable appendix.

¹ SCAQMD's AERMOD-ready meteorological data is available for download here:

<http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod>

² U.S. EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM), AERMOD Modeling System.

Available at: <https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#aermod>

Meteorological Stations

All modeling was performed using SCAQMD's meteorological data processed for AERMOD, as shown in Figure VI-1 below. The locations for each of the 24 stations are given in Table VI-1. It is SCAQMD's policy to continuously update the AERMOD-ready meteorological data every three years; therefore, applicants are advised to check for the most recent version of meteorological data available for use prior to starting any dispersion modeling projects.

The meteorological data used to produce the screening tables in Attachment N was processed with U.S. EPA's AERMET Version 16216. Raw meteorological data from SCAQMD's monitoring stations and the Automated Surface Observing System (ASOS)³ stations were collected for the years of 2010 – 2016. Hourly wind and temperature data were collected from both SCAQMD and ASOS stations, while cloud cover and 1-minute wind data was only available from the ASOS stations. The ASOS 1-minute wind data was processed with U.S. EPA's processor AERMINUTE Version 15272 and included in AERMET for ASOS stations with the use of a wind speed threshold of 0.5 m/s, which is consistent with U.S. EPA's guidelines⁴. The ADJ_U* option was used in AERMET for all stations, as this is now a regulatory option in AERMOD. The ADJ_U* option adjusts the surface friction velocity parameter in the surface file to improve model performance for sources that have peak concentrations under low wind, stable atmospheric conditions⁵.

Surface characteristics, such as albedo, Bowen ratio, and surface roughness, were determined from U.S. EPA's processor AERSURFACE Version 13016. Each station's Bowen ratio varies by year based on the year's precipitation total compared to the 30-year climatological average precipitation. This comparison resulted in a year being classified as Average, Dry, or Wet. For the period of 2010 – 2016, most years fell into the Dry category, with the exception of 2010 and 2016.

After the meteorological data was processed with AERMET, the data went through QA/QC to determine if it passed the U.S. EPA thresholds of less than ten percent missing data by quarter and less than 15 percent calm hours by quarter. The most recent five years of data meeting the QA/QC criteria were then determined for each station, with some stations being eliminated for use in dispersion modeling applications. A number of SCAQMD stations that had been available in the past were determined to no longer be useable for this update, due to not passing the U.S. EPA's QA/QC criteria, or the station being discontinued, or due to having a co-located ASOS station available. Additionally, the ASOS stations within the Basin were included to provide robust coverage for dispersion modeling purposes.

³ The ASOS program is a collaboration between the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). For more information on the ASOS program, please see <http://www.nws.noaa.gov/asos/>.

⁴ See Section 8.4.6 of the U.S. EPA's Appendix W: Guidelines on Air Quality Models. May 22, 2017. https://www3.epa.gov/ttn/scram/appendix_w-2016.htm

⁵ See Section IV.A.2 of the Revisions to the Guideline on Air Quality Models. May 22, 2017. https://www3.epa.gov/ttn/scram/appendix_w-2016.htm

Choosing a Meteorological Station for Modeling

The meteorological station that best represents the facility’s meteorological conditions (such as prevailing winds), terrain, and surrounding land use should be used in all modeling analyses. This means that the closest meteorological station to the facility is not always the most representative meteorologically. The SCAQMD is broken up into 38 source/receptor areas (SRAs) as shown in Figure VI-1. If the prevailing meteorological conditions at the facility are similar to the meteorological station in the facility’s SRA, then the SRA station can be used. All technical justification used in choosing the appropriate meteorological station for dispersion modeling and health risk assessment should be included in the report submitted with the analysis and all electronic modeling files. Please contact SCAQMD modeling staff for questions related to choosing the most appropriate meteorological station for your analysis.

Table VI-1: Locations of SCAQMD’s AERMOD-Ready Meteorological Data and Corresponding Applicable SRA

Station Abbr.	Meteorological Station	Lat./Long. Coordinates		Elevation (m)	Source/Receptor Area (SRA)
		Latitude	Longitude		
AZUS	Azusa	34.1365	-117.9239	182	8, 9, 10
BNAP	Banning	33.9208	-116.8584	660	28, 29
CELA	Central L.A.	34.0664	-118.2267	87	1
ELSI	Lake Elsinore	33.6765	-117.3310	406	25, 26, 27
FONT	Fontana	34.1001	-117.4920	367	34
MSVJ	Mission Viejo	33.6300	-117.6756	170	19, 20, 21
PERI	Perris	33.7889	-117.2278	442	24, 27, 28
PICO	Pico Rivera	34.0103	-118.0686	58	5, 10, 11
RDLA	Redlands	34.0597	-117.1472	481	35, 38
UPLA	Upland	34.1036	-117.6292	379	32, 36
KBUR	Burbank Airport	34.1997	-118.3654	236	7, 8, 15
KCNO	Chino Airport.	33.9756	-117.6249	198	22, 33
KCQT	USC/Downtown L.A.	34.0236	-118.2912	55	1, 12
KFUL	Fullerton Airport	33.8715	-117.9856	29	16, 17
KHHR	Hawthorne Airport	33.9235	-118.3329	19	3, 12
KLAX	Los Angeles Int'l Airport	33.9382	-118.3866	30	3
KLGB	Long Beach Airport	33.8118	-118.1472	10	4, 18
KONT	Ontario Airport	34.0531	-117.5769	289	33
KPSP	Palm Springs Airport	33.8222	-116.5043	125	30, 31
KRAL	Riverside Airport	33.9528	-117.4352	245	22, 23
KSMO	Santa Monica Airport	34.0210	-118.4471	53	2
KSNA	John Wayne Int'l Airport	33.6798	-117.8675	17	17, 18, 20
KTRM	Desert Hot Springs Airport	33.6317	-116.1641	-36	27, 30, 31
KVNY	Van Nuys Airport	34.2123	-118.4915	235	6, 13, 15

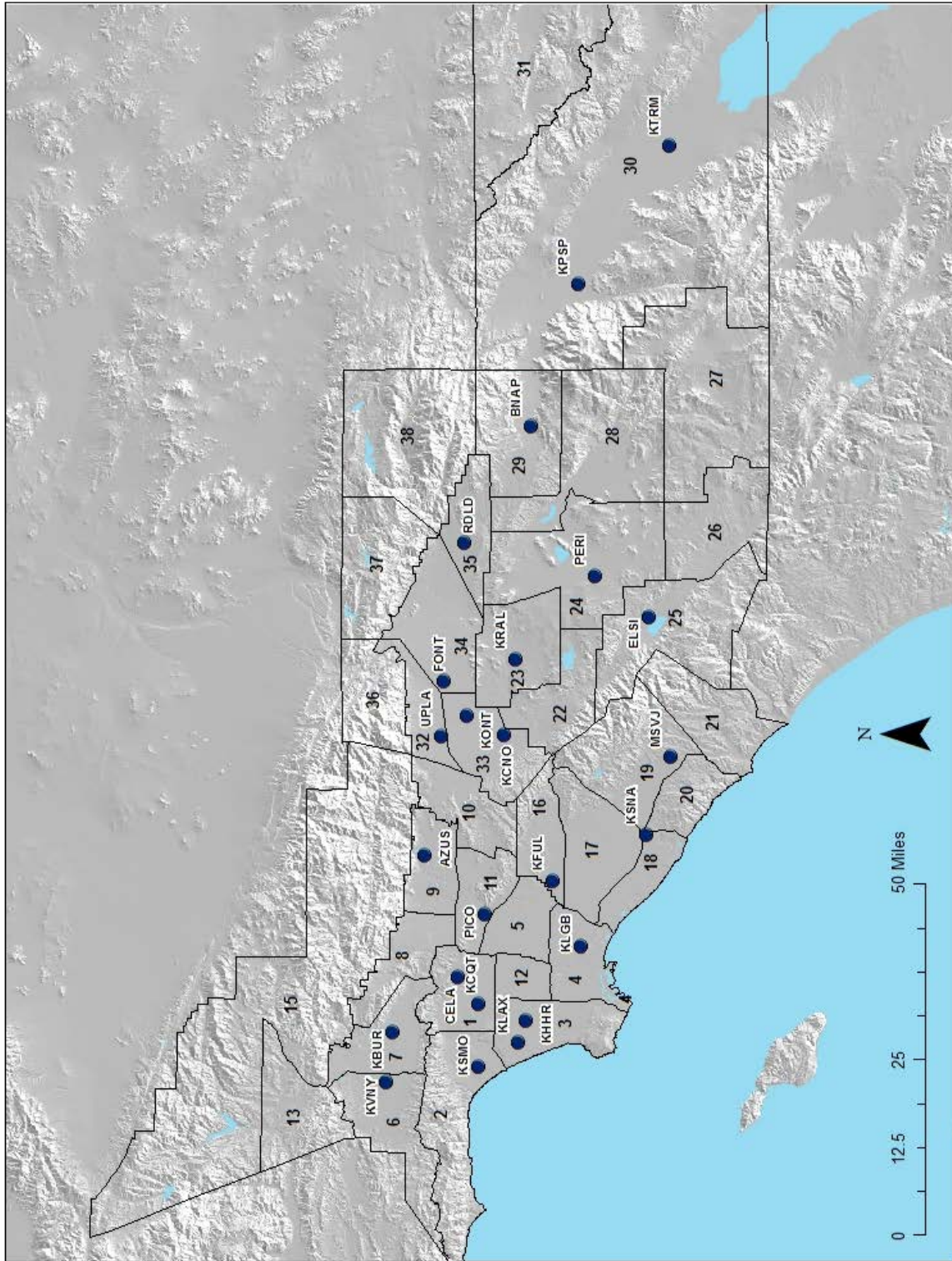


Figure VI-1: Meteorological Monitoring Stations and SRAs in the South Coast Air Basin

APPENDIX VII

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR NON-COMBUSTION SOURCES

Introduction

The purpose of this appendix 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 and Permitting staff (<http://www.aqmd.gov/contact/permitting-staff>) for more information.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

The non-combustion sources were modeled as either a point source or volume source. The point source was modeled as a stack using a constant ambient temperature at the release point (0 K in AERMOD), a 0.3 meter stack diameter and 10 m/s exit velocity with varying release heights. Consistent with the modeling prepared for SCAQMD’s Risk Assessment Procedures (Version 8.0), building downwash effects were analyzed for point sources with a 20 meter by 30 meter building, 4 meters high. Table VII-1 shows the parameters used to model the point sources while Table VII-2 shows the parameters used for the volume sources. The source IDs are used to differentiate between the different parameters for each source configuration.

Table VII-1: Model Parameters for Point Sources

Source ID	Stack Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(in)	(m)	(°F)	(K)	(ft/s)	(m/s)	(ft ³ /min)
P1	14	4.27	12	0.30	Ambient	0*	32.81	10	1,546.1
P2	25	7.62	12	0.30	Ambient	0*	32.81	10	1,546.1
P3	50	15.24	12	0.30	Ambient	0*	32.81	10	1,546.1

Note: * The temperature used in AERMOD was set to 0 K, which indicates that the ambient temperature was used in the model run.

Table VII-2: Model Parameters for Volume Sources

Source ID	Release Height		Lateral Dimension		Vertical Dimension		σ_y	σ_z
	(ft)	(m)	(ft)	(m)	(ft)	(m)	(m)	(m)
V1	7.50	2.29	38.73	11.80	15.00	4.57	2.75	2.13
V2	7.50	2.29	70.71	21.55	15.00	4.57	5.01	2.13
V3	15.00	4.57	70.71	21.55	30.00	9.14	5.01	4.25
V4	7.50	2.29	122.47	37.33	15.00	4.57	8.68	2.13
V5	15.00	4.57	122.47	37.33	30.00	9.14	8.68	4.25
V6	15.00	4.57	212.13	64.66	30.00	9.14	15.04	4.25

A sample AERMOD model input file is provided in Appendix XIII, Exhibit VII.

APPENDIX VIII

**METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES
FOR COMBUSTION SOURCES
(NATURAL GAS BOILERS, NATURAL GAS INTERNAL COMBUSTION
ENGINES, DIESEL INTERNAL COMBUSTION ENGINES)**

Introduction

The purpose of this appendix 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.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Combustion source stacks were modeled as a point source with the stack parameters presented in Table VIII-1. These parameters were based on the San Joaquin Valley Unified Air Pollution Control District's modeling parameters for combustion sources²². Consistent with the modeling prepared for SCAQMD's Risk Assessment Procedures for Rule 1401, building downwash effects were analyzed with a 20 meter by 30 meter building, 4 meters high.

²² San Joaquin Valley Unified Air Pollution Control District, Final Draft Staff Report with Appendices for Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document, found at <https://www.valleyair.org/busind/pto/staff-report-5-28-15.pdf>, accessed on June 15, 2017

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Table VIII-1: Model Parameters for Combustion Sources

Source ID	Release Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(in)	(m)	(°F)	(K)	(ft/s)	(m/s)	(ft ³ /min)
B1	29.53	9	1.46	0.4	332.3	440	16.40	5	11.5
B2	29.53	9	1.83	0.5	386.3	470	22.97	7	25.1
B3	29.53	9	2.01	0.55	386.3	470	29.53	9	39.1
B4	32.81	10	2.45	0.67	386.3	470	32.81	10	64.5
B5	32.81	10	2.63	0.72	431.3	495	39.37	12	89.4
B6	45.93	14	4.02	1.1	332.3	440	32.81	10	173.8
B7	52.49	16	5.49	1.5	314.3	430	39.37	12	387.8
N1	13.12	4	0.26	0.07	1070.3	850	131.23	40	2.8
N2	13.12	4	0.29	0.08	1070.3	850	213.25	65	6.0
N3	13.12	4	0.51	0.14	1142.3	890	180.45	55	15.5
N4	16.40	5	0.69	0.19	1016.3	820	196.85	60	31.1
N5	22.97	7	1.28	0.35	890.3	750	213.25	65	114.4
D1	9.84	3	0.33	0.09	908.3	760	213.25	65	7.6
D2	9.84	3	0.44	0.12	908.3	760	180.45	55	11.4
D3	9.84	3	0.48	0.13	908.3	760	262.47	80	19.4
D4	9.84	3	0.55	0.15	926.3	770	295.28	90	29.1
D5	13.12	4	0.62	0.17	980.3	800	524.93	160	66.4

A sample AERMOD model input file is provided in Appendix XIII, Exhibit VIII.

APPENDIX IX

**METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES
FOR CREMATORIUMS**

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 and Permitting staff (<http://www.aqmd.gov/contact/permitting-staff>).

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Based on information from SCAQMD Engineering and Permitting staff, the model parameters for a standard crematorium is a 13 foot building with a single stack located six feet above the roof of the building. The stack was modeled as a point source with the following stack parameters – 19 feet stack height, 19.03 ft/s exit velocity, 1300°F exit temperature. Due to the sensitivity to building downwash effects, there are three different square building sizes analyzed: 5,000, 10,000, and 15,000 ft².

Table IX-1: Model Parameters for Crematories

Source ID*	Release Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(in)	(m)	(°F)	(K)	(ft/s)	(m/s)	(ft ³ /min)
P1, P2, P3	19	5.79	20	0.508	1,300	977.59	19	5.8	2,490.9

*Same point source model parameters with three separate building sizes to account for differing building downwash effects.

A sample AERMOD model input file is provided in Appendix XIII, Exhibit IX.

APPENDIX X

**METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES
FOR GASOLINE TRANSFER AND DISPENSING FACILITIES**

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to estimate cancer risks from retail gasoline dispensing facilities. The methods are consistent with SCAQMD's Risk Assessment Procedures (Version 8.1), which incorporates the 2015 OEHHA Guidelines. The methods used to estimate emissions, pollutant concentrations, and cancer risks are discussed here. Screening tables of maximum cancer risks at various locations in the Basin and at various residential and occupational distances are provided in Attachment N. This appendix concludes with an example calculation using the cancer risk tables.

Emission Inventory Methods

Rule 461 – Gasoline Transfer and Dispensing 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 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, spillage, and hose permeation 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 either through the vehicle/nozzle interface or the on-board vapor recovery (ORVR) system.

Spillage – Emissions occur from evaporating gasoline that spills during vehicle refueling.

Hose Permeation – Emissions occur when liquid gasoline or gasoline vapors diffuse through the dispensing hose outer surface to the atmosphere.

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 TACs emitted from the gasoline stations, only benzene, ethylbenzene, and naphthalene have cancer toxicity values.

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The emission factors for each of the five processes are summarized in Table X-1. The factors given in the table follow CARB’s 2013 Revised Controlled Gasoline Emission Factors except for Phase II Onboard Refueling Vapor Recovery (ORVR). SCAQMD staff has been in communication with CARB staff regarding the refueling emissions factor. Both agencies agree that additional time is needed to better understand emission reductions from Phase II EVR for ORVR vehicles. SCAQMD staff is recommending not to incorporate CARB’s 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD’s current emission factor of 0.32 lbs per 1,000 gallons for refueling. Staff is recommending the use of CARB’s 2013 emission factors for all other categories (loading, breathing, spillage, and hose permeation). The SCAQMD staff is committed to continue working with CARB staff to refine the refueling emission estimates for Phase II controls with ORVR vehicles and will return to the Board with future revisions to refueling emission factors. It is important to note that for purposes of modeling, Phase II emissions are broken up into refueling and breathing for dispersion modeling purposes.

Table X-1. Gasoline Emission Factors for Retail Service Stations Process		Loading	Breathing	Refueling	Hose Permeation	Spillage
Controlled Gasoline EF (lbs/1,000 gal)		0.15	0.024	0.32	0.009	0.24
Benzene	Weight Percent	0.455%	0.455%	0.455%	0.455%	0.707%
	Emission Factor (lbs/1,000 gal)	0.000683	0.000109	0.00146	0.000041	0.0017
Ethylbenzene	Weight Percent	0.107%	0.107%	0.107%	0.107%	1.29%
	Emission Factor (lbs/1,000 gal)	0.000161	0.0000257	0.000342	0.00000963	0.0031
Naphthalene	Weight Percent	0.0004%	0.0004%	0.0004%	0.0004%	0.174%
	Emission Factor (lbs/1,000 gal)	0.0000006	0.000000096	0.00000128	0.000000036	0.000418

Note: *The weight percentages of the TACs evaluated for cancer risk are based on a weighted summer (214 days per year) and winter (151 days per year) gasoline speciation.

*Gasoline speciation profile: <https://www.arb.ca.gov/ei/speciate/refspec.htm>

*Actual modeling emission factors may vary due to rounding.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

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.

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The California Air Pollution Control Officers Association (CAPCOA) has developed industry-wide risk assessment guidelines for gasoline service stations²³ (1997 CAPCOA Guidelines) and has started the process to update these guidelines using the 2015 OEHHA Guidelines and SCAQMD staff is participating in that Working Group. The current industry-wide risk assessment guidance was approved in 1997. These risk assessment 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 stations²³:

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 follows the 1997 CAPCOA Guidelines unless otherwise noted.

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, spillage, and hose permeation 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 and hose permeation, 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 the 1997 CAPCOA Guidelines 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 1997 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, CAPCOA concluded that it is not necessary to include building downwash when determining the dispersion from the vent pipes when using ISCST3. In order to determine the effects of building downwash using AERMOD, a similar analysis was conducted by SCAQMD staff with the same building dimensions using the BPIP-PRIME computer program. The modeling results showed that building downwash caused the maximum ground level

¹⁰ The 1997 CAPCOA AB2588 Gasoline Service Station Industrywide Risk Assessment Guidelines are available on the internet at: <https://www.arb.ca.gov/ab2588/rtrap-iwra/GasIWRA.pdf>

concentrations to more than double. Therefore, building downwash has a significant effect on the maximum concentrations and subsequent cancer risk and thus, 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 development of screening tables 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 6:00 a.m. to 8:00 p.m. and the remaining 20 percent of the daily emissions occur equally each hour from 8:00 p.m. to 6:00 a.m.

A sample AERMOD model input file for the generic retail service station described above is included in Appendix XIII, Exhibit X.

The peak model-predicted impacts at each downwind distance over the 36 azimuth angles are used to develop the screening cancer risk tables for gasoline service stations (see Attachment N, Tables 12.1A – 12.2B).

Cancer Risk Screening Tables

Based on a review of the 16 TACs emitted from gasoline, only three (benzene, ethylbenzene, and naphthalene) result in cancer effects and were analyzed for cancer risk. Cancer risk screening 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.

The following paragraphs describe how the cancer risks from a typical gasoline service station can be estimated from the screening tables as follows: First, determine which of the 24 meteorological site locations in these tables best represents the facility's meteorological conditions and location. The SCAQMD is broken up into 38 source/receptor areas (SRAs) as shown in Appendix VI, Figure VI-1. As shown in Appendix VI, Table VI-1, each of the 24 meteorological sites is assigned to the appropriate SRAs, which can then be used to choose the corresponding meteorological site for each gasoline dispensing facility.

Next, determine the distance from the service station to the nearest residential and off-site worker location. Tables 12.1 A – 12.2 B in Attachment N provide the maximum cancer risks for a gasoline dispensing station with either underground or aboveground storage tanks with a one million gallons per year throughput at various residential and off-site worker distances, respectively. Using the data from these tables and steps described above, determine the applicable cancer risks.

Lastly, multiply the cancer risks by the requested annual gasoline throughput of the service station. An example of a risk calculation is provided for a hypothetical gasoline service station on page X-8.

Results

Figure X-1 shows the TAC species apportionment in gasoline and Figure X-2 shows the source apportionment of the calculated cancer risks for underground storage tanks. Using the results from the Ontario Airport meteorological station and at a downwind distance of 25 meters, emissions from spillage account for 48.5 percent of the cancer risk, while benzene is the air toxics which drives the cancer risk, accounting for 84 percent. This is consistent with the discussion of the relative toxicity of substances in gasoline found in Appendix I of the 1997 CAPCOA Guidelines, which shows that benzene is the most important TAC driving the cancer risks at gasoline service stations.

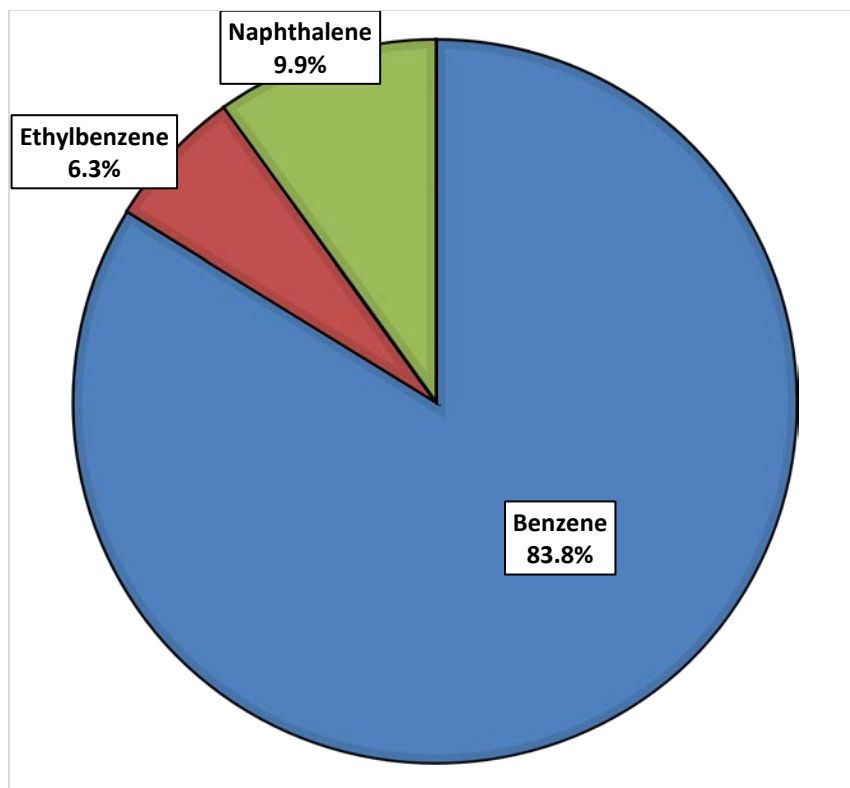


Figure X-1: Cancer Risk by Toxic Compound

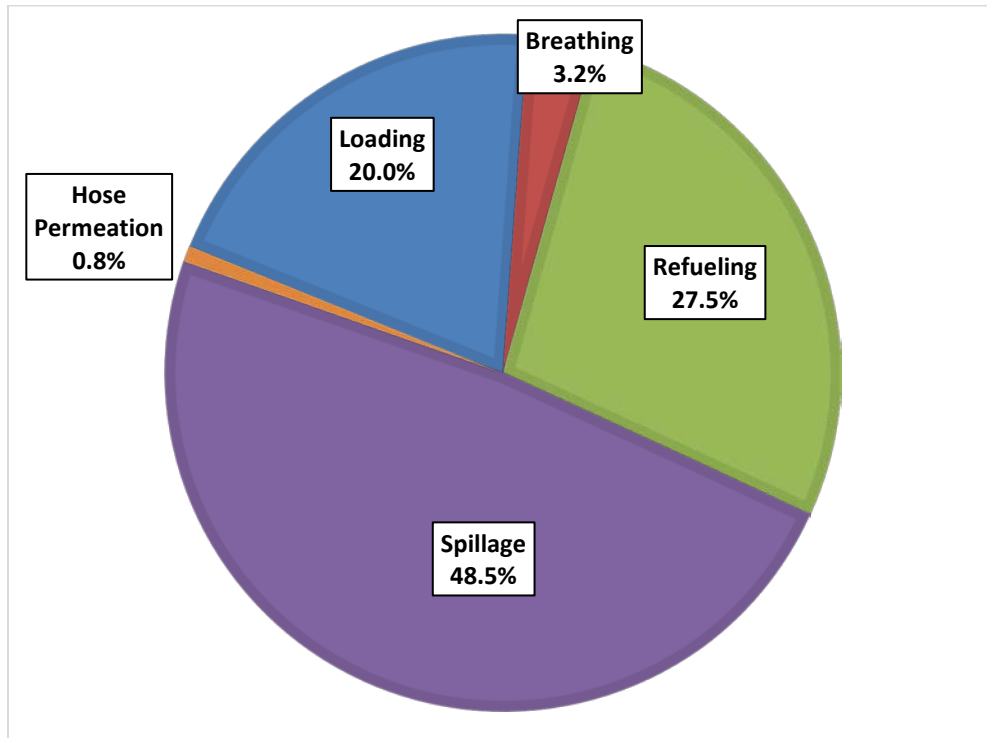


Figure X-2: Cancer Risk by Source

Sensitivity Analysis Regarding Non-Cancer Risks

A sensitivity analysis examining the chronic and acute non-cancer risks was prepared using CARB’s speciation profile of 16 TACs in gasoline, the Ontario International Airport meteorological station, a receptor distance of 25 meters, and a throughput of one million gallons per year. The TACs included in CARB’s speciation profile are n-butyl alcohol, benzene, isoprene, naphthalene, 2-methyl naphthalene, o-xylene, 1,2,4-trimethylbenzene, cumene, ethylbenzene, p-xylene, m-xylene, toluene, hexane, cyclohexane, propylene, and 2,2,4-trimethylpentane. As seen in Table X-2, the sensitivity analysis calculated the Hazard Index (HI) for each of the 16 TACs, which was then summed, regardless of target organ.

Table X-2: Sensitivity Analysis Results for Non-Cancer Risks

TACs	Chronic HI	Acute HI
Benzene	0.01996	0.02967
Ethylbenzene	0.000025909	0
Naphthalene	0.000654	0
Toluene	0.000925	0.000102
m-Xylene	0.0001846	0.00008009
o-Xylene	0.0001013	0.00004398
p-Xylene	0.0000774	0.00003357
Hexane	0.00002951	0
Propylene	0.0000000398	0
1,2,4-trimethylbenzene	0	0
2,2,4-trimethylpentane	0	0
2-methyl naphthalene	0	0
Cumene	0	0
Cyclohexane	0	0
Isoprene	0	0
n-Butyl Alcohol	0	0
Max Chronic HI	0.01996	0.02967
Million Gallons of Throughput to reach HI = 1.0	50.09	33.7

The results of the sensitivity analysis show that benzene is the driver for both the chronic and acute hazard indices, with risks from benzene being two orders of magnitude higher than the next highest TAC. Using CARB’s speciation profile, seven of the 16 TACs did not have RELs associated with them. The maximum chronic HI was 0.02 and the maximum acute HI was 0.03 at a throughput of one million gallons of gasoline per year. The results demonstrate that for the maximum permitted risk of ten in a million, the acute and chronic HI are much lower (< 0.1) than the threshold of 1.0. Therefore, the chronic and acute non-cancer health effects do not need to be calculated, which is consistent with the 1997 CAPCOA Guidelines.

Example Calculation

The following example demonstrates how SCAQMD staff plans to estimate cancer risk values for retail gasoline dispensing facilities based on information received and using Attachment N, Tables 12.1 A – 12.2 B.

The calculation steps are as follows:

1. **Cancer Risk (CR):** Cancer risk values are estimated for 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 Attachment N, Tables 12.1A and 12.2A.
 - b. *Off-Site Worker CR:* Use the facility location and the distance to the nearest worker to identify the risk. The off-site worker CRs for retail gasoline dispensing are contained in Table 12.1B and 12.2B.
 - 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 (Attachment N, Tables 12.1 A – 12.2 B) are based on a gasoline throughput of one million (MM) gallons per year (gal/yr). The annual facility throughput should be multiplied by the values contained in the gasoline dispensing risk tables to calculate the appropriate facility risk.
- The SCAQMD maintains 24 meteorological stations that are processed for modeling purposes, as shown in Appendix VI, Figure VI-1 and Appendix VI, Table VI-1. The meteorological station that best represents the facility's meteorological conditions (such as prevailing winds), terrain, and surrounding land use should be used. This means that the closest meteorological station to the facility is not always the most representative meteorologically.
- The gasoline dispensing risk tables (Attachment N, Tables 12.1 A – 12.2 B) are based on discrete downwind distances. 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, the hazard index will not be calculated for inclusion in the gasoline dispensing risk tables.

Example: A retail gasoline dispensing facility with an underground storage tank submits the following information with their application: 15 MM gal/yr gasoline requested throughput, located in Yorba Linda, nearest residential receptor 200 meters away, and nearest off-site worker receptor 25 meters away.

In this example, the actual downwind distances match the distances found in the tables. However, when the actual downwind distances are not in the tables, then using linear interpolation to calculate between the distance cells is acceptable to obtain cancer risks for the actual downwind distances.

2. Cancer Risk (CR):

- a. Residential CR: According to Appendix VI, Table VI-1, Yorba Linda is located in SRA 16 and the appropriate meteorological station is in Fullerton (KFUL). Using Attachment N, Table 12.1 A for the Fullerton meteorological station, the residential cancer risk is 0.104 in one million (200 meters) for 1 MM gal/yr. Since the facility's requested gasoline throughput for this example is 15 MM gal/yr, the corresponding residential cancer risk is 1.56 in one million.

$$\text{Residential CR} = \frac{0.104 \text{ in one million}}{(1 \text{ MM gal/yr})} \times 15 \text{ MM gal/yr}$$

Residential CR = 1.56 in one million

- b. Worker CR: According to Appendix VI, Table VI-1, Yorba Linda is located in SRA 16 and the appropriate meteorological station is in Fullerton (KFUL). Using Attachment N, Table 12.1 B, the occupational cancer risk is 0.225 in one million (25 meters) 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 3.38 in one million.

$$\text{Occupational CR} = \frac{0.225 \text{ in one million}}{(1 \text{ MM gal/yr})} \times 15 \text{ MM gal/yr}$$

Occupational CR = 3.38 in one million
--

- c. MICR: The MICR for this retail gasoline facility is **3.38** in one million (occupational receptor).

APPENDIX XI

**METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES
FOR SPRAY BOOTHS**

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to develop the screening tables for spray booths. 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 and Permitting staff (<http://www.aqmd.gov/contact/permitting-staff>) for more information.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Based on information from SCAQMD Engineering and Permitting staff, the model parameters were developed for two typical spray booth configurations, each with a single stack vent located 6 feet above the roof of a building. Each spray booth was modeled as a point source using the parameters shown in Table XI-1. Building downwash effects were analyzed, with a building size of 20 meters by 70 meters and a building height of 6 feet below each stack height.

Table XI-1: Model Parameters for Spray Booths

Source ID	Stack Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(ft)	(m)	(°F)	(K)	(ft/s)	(m/s)	(ft ³ /min)
P1	16	4.88	2.83	0.864	Ambient	0*	26.43	8.05	10,000
P2	24	7.32	2.83	0.864	Ambient	0*	26.43	8.05	10,000

Note: * The temperature used in AERMOD was set to 0 K, which indicates that the ambient temperature was used in the model run.

A sample AERMOD model input file is provided in Appendix XIII, Exhibit XI.

APPENDIX XII

**METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES
FOR SHORT-TERM PROJECTS**

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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.

When conducting a Tier 2 analysis for short-term projects, you may also use the following equation using a **default exposure value (CEF)**:

$$\text{MICR}_{(R,ST)} = \text{CP} \times \text{Q}_{\text{tpy}} \times \chi/\text{Q} \times \text{CEF}_{(R,ST)} \times \text{MP}_{(R,ST)} \times 10^{-6} \times \text{MWF}$$

$$\text{MICR}_{(W,ST)} = \text{CP} \times \text{Q}_{\text{tpy}} \times \chi/\text{Q} \times \text{CEF}_{(W,ST)} \times \text{MP}_{(W,ST)} \times \text{WAF} \times 10^{-6} \times \text{MWF}$$

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)]	Attachment N, Tables 6.1 A – 7.6 B
MWAF	Molecular Weight Adjustment Factor	Consolidated Health Values Table found at https://www.arb.ca.gov/toxics/healthval/contable.pdf
CP	Cancer Potency (mg/kg-day) ⁻¹	
MP	Multi-Pathway Adjustment Factor (if applicable)	Attachment N, Table 3.1
CEF	Combined Exposure Factor	Attachment N, Tables 4.1 A – 4.2 D
WAF	Worker Adjustment Factor	Attachment N, Tables 5.1 and 5.2
10 ⁻⁶	Micrograms to milligrams conversion, liters to cubic meters conversion	not applicable

Please note that SCAQMD Engineering and Permitting 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

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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).

APPENDIX XIII

**AERMOD INPUT FILES USED TO DEVELOP
TIER 2 SCREENING TABLES**

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

Exhibit VII - Sample AERMOD Input Files for Non-Combustion Sources

Non-Combustion Point Sources (P1, P2, P3)

```

CO STARTING
TITLEONE R1401 Risk Assessment Procedures
TITLETWO Continuous Operation
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
POLLUTID Any
RUNORNOT RUN
URBANOPT 9818605 LA
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
SRCPARAM P1 2.88E-02 4.27 0 10.0 0.3
SRCPARAM P2 2.88E-02 7.62 0 10.0 0.3
SRCPARAM P3 2.88E-02 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
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SO BUILDWID P1 24.91 29.05 32.32 34.60 35.84 35.98
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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
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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
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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

```

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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 BUILDLN P3 33.02 35.03 35.98 35.84 34.60 32.32
 SO BUILDLN P3 29.05 24.91 20.00 24.91 29.05 32.32
 SO BUILDLN P3 34.60 35.84 35.98 35.03 33.02 30.00
 SO BUILDLN P3 33.02 35.03 35.98 35.84 34.60 32.32
 SO BUILDLN P3 29.05 24.91 20.00 24.91 29.05 32.32
 SO BUILDLN 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
 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 AZUS_v9.SFC
 PROFFILE AZUS_v9.PFL
 SURFDATA 0 2010
 UAIRDATA 3190 2010
 PROFBASE 0.0 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

Non-Combustion Volume Source (V1)

CO STARTING
 TITLEONE Modeling for R1401 Risk Assessment Procedures
 TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
 MODELOPT CONC FLAT
 AVERTIME 1 PERIOD
 URBANOPT 9818605 LA
 POLLUTID ANY
 RUNORNOT RUN
 CO FINISHED
 SO STARTING
 LOCATION V1 VOLUME 0.0 0.0 0.0

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212

```
SRCPARAM V1      0.0288      2.29      2.75      2.13
URBANSRC ALL
SRCGROUP V1      V1
SRCGROUP ALL
SO FINISHED
RE STARTING
GRIDPOLR UPOL1 STA
          ORIG 0.0 0.0
          DIST 33 58 83 108 208 308 508 1008
          GDIR 36 0.0 10.0
GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
SURFFILE AZUS_v9.SFC
PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
SITEDATA 99999 2010
PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
RECTABLE ALLAVE 1ST
RECTABLE 1 1ST
PLOTFILE 1 V1 1ST  BM1T1V1.TXT
PLOTFILE PERIOD V1  BM1T2V1.TXT
OU FINISHED
```

Non-Combustion Volume Source (V2 and V3)

```
CO STARTING
TITLEONE Modeling for R1401 Risk Assessment Procedures
TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
URBANOPT 9818605 LA
POLLUTID ANY
RUNORNOT RUN
CO FINISHED
SO STARTING
LOCATION V2 VOLUME  0.0 0.0 0.0
LOCATION V3 VOLUME  0.0 0.0 0.0
SRCPARAM V2      0.0288      2.29      5.01      2.13
SRCPARAM V3      0.0288      4.57      5.01      4.25
URBANSRC ALL
SRCGROUP V2      V2
SRCGROUP V3      V3
SRCGROUP ALL
SO FINISHED
RE STARTING
GRIDPOLR UPOL1 STA
          ORIG 0.0 0.0
          DIST 40 65 90 115 215 315 515 1015
          GDIR 36 0.0 10.0
GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
SURFFILE AZUS_v9.SFC
PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
SITEDATA 99999 2010
PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
RECTABLE ALLAVE 1ST
RECTABLE 1 1ST
PLOTFILE 1 V2 1ST  BM1T1V2.TXT
PLOTFILE 1 V3 1ST  BM1T1V3.TXT
PLOTFILE PERIOD V2  BM1T2V2.TXT
PLOTFILE PERIOD V3  BM1T2V3.TXT
OU FINISHED
```

Non-Combustion Volume Source (V4 and V5)

```
CO STARTING
TITLEONE Modeling for R1401 Risk Assessment Procedures
TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
```

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212

```
URBANOPT 9818605 LA
POLLUTID ANY
RUNORNOT RUN
CO FINISHED
SO STARTING
LOCATION V4 VOLUME 0.0 0.0 0.0
LOCATION V5 VOLUME 0.0 0.0 0.0
SRCPARAM V4 0.0288 2.20 8.68 2.13
SRCPARAM V5 0.0288 4.57 8.68 4.25
URBANSRC ALL
SRCGROUP V4 V4
SRCGROUP V5 V5
SRCGROUP ALL
SO FINISHED
RE STARTING
GRIDPOLR UPOL1 STA
ORIG 0.0 0.0
DIST 51 76 101 126 226 326 526 1026
GDIR 36 0.0 10.0
GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
SURFFILE AZUS_v9.SFC
PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
SITEDATA 99999 2010
PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
RECTABLE ALLAVE 1ST
RECTABLE 1 1ST
PLOTFILE 1 V4 1ST BM1T1V4.TXT
PLOTFILE 1 V5 1ST BM1T1V5.TXT
PLOTFILE PERIOD V4 BM1T2V4.TXT
PLOTFILE PERIOD V5 BM1T2V5.TXT
OU FINISHED
```

Non-Combustion Volume Source (V6)

```
CO STARTING
TITLEONE Modeling for R1401 Risk Assessment Procedures
TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
URBANOPT 9818605 LA
POLLUTID ANY
RUNORNOT RUN
CO FINISHED
SO STARTING
LOCATION V6 VOLUME 0.0 0.0 0.0
SRCPARAM V6 0.02885 4.57 15.04 4.25
URBANSRC ALL
SRCGROUP V6 V6
SRCGROUP ALL
SO FINISHED
RE STARTING
GRIDPOLR UPOL1 STA
ORIG 0.00 0.00
DIST 71 96 121 146 246 346 546 1046
GDIR 36 0.00 10.00
GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
SURFFILE AZUS_v9.SFC
PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
SITEDATA 99999 2010
PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
RECTABLE ALLAVE 1ST
RECTABLE 1 1ST
PLOTFILE 1 V6 1ST BM1T1V6.TXT
PLOTFILE PERIOD V6 BM1T2V6.TXT
OU FINISHED
```


**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

Exhibit VIII - Sample AERMOD Input File for Combustion Sources

```

CO STARTING
TITLEONE Combustion Screening Table
TITLETWO Continuous Operation
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
POLLUTID Any
RUNORNOT RUN
URBANOPT 9818605 LA
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
SRCPARAM D1 2.88E-02 3.0 760 65.0 0.09
SRCPARAM D2 2.88E-02 3.0 760 55.0 0.12
SRCPARAM D3 2.88E-02 3.0 760 80.0 0.13
SRCPARAM D4 2.88E-02 3.0 770 90.0 0.15
SRCPARAM D5 2.88E-02 4.0 800 160.0 0.17
SRCPARAM N1 2.88E-02 4.0 850 40.0 0.07
SRCPARAM N2 2.88E-02 4.0 850 65.0 0.08
SRCPARAM N3 2.88E-02 4.0 890 55.0 0.14
SRCPARAM N4 2.88E-02 5.0 820 60.0 0.19
SRCPARAM N5 2.88E-02 7.0 750 65.0 0.35
SRCPARAM B1 2.88E-02 9.0 440 5.0 0.40
SRCPARAM B2 2.88E-02 9.0 470 7.0 0.50
SRCPARAM B3 2.88E-02 9.0 470 9.0 0.55
SRCPARAM B4 2.88E-02 10.0 470 10.0 0.67
SRCPARAM B5 2.88E-02 10.0 495 12.0 0.72
SRCPARAM B6 2.88E-02 14.0 440 10.0 1.10
SRCPARAM B7 2.88E-02 16.0 430 12.0 1.50
BUILDHGT D1 4.00 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 4.00
BUILDHGT D1 4.00 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 4.00
BUILDHGT D1 4.00 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
BUILDLN D1 33.02 35.03 35.98 35.84 34.60 32.32
BUILDLN D1 29.05 24.91 20.00 24.91 29.05 32.32
BUILDLN D1 34.60 35.84 35.98 35.03 33.02 30.00
BUILDLN D1 33.02 35.03 35.98 35.84 34.60 32.32
BUILDLN D1 29.05 24.91 20.00 24.91 29.05 32.32
BUILDLN 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

```

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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
BUILDLN D2	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN D2	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN D2	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN D2	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN D2	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN 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
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
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
BUILDLN D3	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN D3	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN D3	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN D3	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN D3	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN 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
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
BUILDLN D4	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN D4	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN D4	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN D4	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN D4	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN 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

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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
BUILDLN N2	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN N2	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN N2	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN N2	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN N2	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN 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
BUILDLN N3	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN N3	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN N3	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN N3	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN N3	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN 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
BUILDLN N4	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN N4	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN N4	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN N4	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN N4	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN 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

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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
BUILDLN	N5	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN	N5	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN	N5	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN	N5	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN	N5	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN	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
BUILDLN	B1	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN	B1	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN	B1	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN	B1	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN	B1	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN	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
BUILDLN	B2	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLN	B2	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLN	B2	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLN	B2	33.02	35.03	35.98	35.84	34.60	32.32

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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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
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 AZUS_v9.SFC
PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
RECTABLE 1 FIRST
RECTABLE ALLAVE FIRST
PLOTFILE 1 D1 FIRST BM1T1D1.TXT
PLOTFILE PERIOD D1 BM1T2D1.TXT
PLOTFILE 1 D2 FIRST BM1T1D2.TXT
PLOTFILE PERIOD D2 BM1T2D2.TXT
PLOTFILE 1 D3 FIRST BM1T1D3.TXT
PLOTFILE PERIOD D3 BM1T2D3.TXT
PLOTFILE 1 D4 FIRST BM1T1D4.TXT
PLOTFILE PERIOD D4 BM1T2D4.TXT
PLOTFILE 1 D5 FIRST BM1T1D5.TXT
PLOTFILE PERIOD D5 BM1T2D5.TXT
PLOTFILE 1 N1 FIRST BM1T1N1.TXT
PLOTFILE PERIOD N1 BM1T2N1.TXT
PLOTFILE 1 N2 FIRST BM1T1N2.TXT
PLOTFILE PERIOD N2 BM1T2N2.TXT
PLOTFILE 1 N3 FIRST BM1T1N3.TXT
PLOTFILE PERIOD N3 BM1T2N3.TXT
PLOTFILE 1 N4 FIRST BM1T1N4.TXT
PLOTFILE PERIOD N4 BM1T2N4.TXT
PLOTFILE 1 N5 FIRST BM1T1N5.TXT
PLOTFILE PERIOD N5 BM1T2N5.TXT
PLOTFILE 1 B1 FIRST BM1T1B1.TXT

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**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

PLOTFILE	PERIOD	B1		BM1T2B1.TXT
PLOTFILE	1	B2	FIRST	BM1T1B2.TXT
PLOTFILE	PERIOD	B2		BM1T2B2.TXT
PLOTFILE	1	B3	FIRST	BM1T1B3.TXT
PLOTFILE	PERIOD	B3		BM1T2B3.TXT
PLOTFILE	1	B4	FIRST	BM1T1B4.TXT
PLOTFILE	PERIOD	B4		BM1T2B4.TXT
PLOTFILE	1	B5	FIRST	BM1T1B5.TXT
PLOTFILE	PERIOD	B5		BM1T2B5.TXT
PLOTFILE	1	B6	FIRST	BM1T1B6.TXT
PLOTFILE	PERIOD	B6		BM1T2B6.TXT
PLOTFILE	1	B7	FIRST	BM1T1B7.TXT
PLOTFILE	PERIOD	B7		BM1T2B7.TXT

OU FINISHED

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

Exhibit IX - Sample AERMOD Input File for Crematories

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CO STARTING
TITLEONE Modeling for R1401 Risk Assessment Procedures
TITLETWO Crematory - Continuous Operation
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
URBANOPT 9818605 LA
POLLUTID Any
RUNORNOT RUN
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
SRCPARAM P1 2.885E-02 5.791 977.59 5.8 0.508
SRCPARAM P2 2.885E-02 5.791 977.59 5.8 0.508
SRCPARAM P3 2.885E-02 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 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

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**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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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 AZUS_v9.SFC
PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
PROFBASE 0 METERS
ME FINISHED
OU STARTING
RECTABLE 1 FIRST
RECTABLE ALLAVE FIRST
PLOTFILE 1 P1 FIRST BM1T1P1.TXT
PLOTFILE PERIOD P1 FIRST BM1T2P1.TXT
PLOTFILE 1 P2 FIRST BM1T1P2.TXT
PLOTFILE PERIOD P2 FIRST BM1T2P2.TXT
PLOTFILE 1 P3 FIRST BM1T1P3.TXT
PLOTFILE PERIOD P3 FIRST BM1T2P3.TXT
OU FINISHED

```

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

**Exhibit X - Sample AERMOD Input Files for Gasoline Transfer and Dispensing Facilities
(Underground Storage Tanks and Aboveground Storage Tanks)**

Underground Gasoline Tank

```

CO STARTING
TITLEONE SCAQMD R461 SCREEN TABLE PREPARATION
TITLETWO Template - Underground, 10mX5mX4m building in middle
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
URBANOPT 9818605 LA
POLLUTID ANY
RUNORNOT RUN
CO FINISHED
SO STARTING
LOCATION P1 POINT 0.0 0.0 0.0
LOCATION P3 POINT 0.0 0.0 0.0
LOCATION P5 POINT 0.0 0.0 0.0
LOCATION P2 POINT 0.0 0.0 0.0
LOCATION P4 POINT 0.0 0.0 0.0
LOCATION P6 POINT 0.0 0.0 0.0
LOCATION V1 VOLUME 0.0 0.0 0.0
LOCATION V4 VOLUME 0.0 0.0 0.0
LOCATION V7 VOLUME 0.0 0.0 0.0
LOCATION V2 VOLUME 0.0 0.0 0.0
LOCATION V5 VOLUME 0.0 0.0 0.0
LOCATION V8 VOLUME 0.0 0.0 0.0
LOCATION V3 VOLUME 0.0 0.0 0.0
LOCATION V6 VOLUME 0.0 0.0 0.0
LOCATION V9 VOLUME 0.0 0.0 0.0
SRCPARAM P1 9.84E-06 3.66 291.5 0.00063 0.051
SRCPARAM P2 1.57E-06 3.66 288.7 0.00010 0.051
SRCPARAM P3 2.30E-06 3.66 291.5 0.00063 0.051
SRCPARAM P4 3.68E-07 3.66 288.7 0.00010 0.051
SRCPARAM P5 9.56E-09 3.66 291.5 0.00063 0.051
SRCPARAM P6 1.53E-09 3.66 288.7 0.00010 0.051
SRCPARAM V1 2.10E-05 1.0 3.02 2.33
SRCPARAM V2 2.44E-05 0.0 3.02 2.33
SRCPARAM V3 5.90E-07 1.0 3.02 2.33
SRCPARAM V4 4.91E-06 1.0 3.02 2.33
SRCPARAM V5 4.44E-05 0.0 3.02 2.33
SRCPARAM V6 1.38E-07 1.0 3.02 2.33
SRCPARAM V7 2.04E-08 1.0 3.02 2.33
SRCPARAM V8 6.00E-06 0.0 3.02 2.33
SRCPARAM V9 5.74E-10 1.0 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 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 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 P5 4.00 4.00 4.00 4.00 4.00 4.00
BUILDHGT P5 4.00 4.00 4.00 4.00 4.00 4.00
BUILDHGT P5 4.00 4.00 4.00 4.00 4.00 4.00
BUILDHGT P5 4.00 4.00 4.00 4.00 4.00 4.00
BUILDHGT P5 4.00 4.00 4.00 4.00 4.00 4.00
BUILDHGT P5 4.00 4.00 4.00 4.00 4.00 4.00
BUILDHGT P6 4.00 4.00 4.00 4.00 4.00 4.00

```

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

BUILDHGT P6	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT P6	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT P6	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT P6	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT P6	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
BUILDWID P5	6.66	8.12	9.33	10.26	10.87	11.16
BUILDWID P5	11.11	10.72	10.00	10.72	11.11	11.16
BUILDWID P5	10.87	10.26	9.33	8.12	6.66	5.00
BUILDWID P5	6.66	8.12	9.33	10.26	10.87	11.16
BUILDWID P5	11.11	10.72	10.00	10.72	11.11	11.16
BUILDWID P5	10.87	10.26	9.33	8.12	6.66	5.00
BUILDWID P6	6.66	8.12	9.33	10.26	10.87	11.16
BUILDWID P6	11.11	10.72	10.00	10.72	11.11	11.16
BUILDWID P6	10.87	10.26	9.33	8.12	6.66	5.00
BUILDWID P6	6.66	8.12	9.33	10.26	10.87	11.16
BUILDWID P6	11.11	10.72	10.00	10.72	11.11	11.16
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
BUILDLEN P5	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN P5	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN P5	10.26	10.87	11.16	11.11	10.72	10.00
BUILDLEN P5	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN P5	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN P5	10.26	10.87	11.16	11.11	10.72	10.00
BUILDLEN P6	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN P6	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN P6	10.26	10.87	11.16	11.11	10.72	10.00
BUILDLEN P6	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN P6	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN P6	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

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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
XBADJ	P5	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P5	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P5	-5.13	-5.44	-5.58	-5.55	-5.36	-5.00
XBADJ	P5	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P5	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P5	-5.13	-5.44	-5.58	-5.55	-5.36	-5.00
XBADJ	P6	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P6	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P6	-5.13	-5.44	-5.58	-5.55	-5.36	-5.00
XBADJ	P6	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P6	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P6	-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
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
URBANSRC	P1						
URBANSRC	P2						
URBANSRC	P3						
URBANSRC	P4						
URBANSRC	P5						
URBANSRC	P6						
URBANSRC	V1						
URBANSRC	V2						
URBANSRC	V3						

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

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URBANSRC V4
URBANSRC V5
URBANSRC V6
URBANSRC V7
URBANSRC V8
URBANSRC V9
EMISFACT P1 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P1 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P1 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P1 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P2 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P2 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P3 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P3 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P4 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P4 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
EMISFACT P5 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P5 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P5 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P5 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
EMISFACT P6 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P6 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P6 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT P6 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V1 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V1 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V2 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V2 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V3 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V3 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V4 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V4 HROFDY 1.37 1.37 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 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V5 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V5 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
EMISFACT V6 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V6 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V6 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V6 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
EMISFACT V7 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V7 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V7 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V7 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
EMISFACT V8 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V8 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V8 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V8 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
EMISFACT V9 HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V9 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V9 HROFDY 1.37 1.37 1.37 1.37 1.37 1.37
EMISFACT V9 HROFDY 1.37 1.37 0.48 0.48 0.48 0.48
SRCGROUP BE P1 P2 V1 V2 V3
SRCGROUP EB P3 P4 V4 V5 V6
SRCGROUP NA P5 P6 V7 V8 V9
SO FINISHED
RE STARTING
GRIDPOLR POL1 STA
      ORIG 0.0 0.0
      DIST 34 59 84 109 209 309 509 1009
      GDIR 36 10.0 10.0
GRIDPOLR POL1 END
RE FINISHED
ME STARTING
SURFFILE AZUS_v9.SFC

```

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212

```

PROFFILE AZUS_v9.PFL
SURFDATA 0 2010
UAIRDATA 3190 2010
SITEDATA 99999 2010
PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
RECTABLE ALLAVE 1ST
RECTABLE 1 1ST
PLOTFILE 1 BE 1ST UMIT1BE.TXT
PLOTFILE 1 EB 1ST UMIT1EB.TXT
PLOTFILE 1 NA 1ST UMIT1NA.TXT
PLOTFILE PERIOD BE UMIT2BE.TXT
PLOTFILE PERIOD EB UMIT2EB.TXT
PLOTFILE PERIOD NA UMIT2NA.TXT
OU FINISHED
  
```

Aboveground Gasoline Tank

```

CO STARTING
TITLEONE SCAQMD R461 SCREEN TABLE PREPARATION
TITLETWO Template - Aboveground, 10mX5mX4m building in middle
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
POLLUTID ANY
RUNORNOT RUN
URBANOPT 9818605 LA
CO FINISHED
SO STARTING
  
```

LOCATION P1	POINT	0.0	0.0	0.0				
LOCATION P3	POINT	0.0	0.0	0.0				
LOCATION P5	POINT	0.0	0.0	0.0				
LOCATION P2	POINT	0.0	0.0	0.0				
LOCATION P4	POINT	0.0	0.0	0.0				
LOCATION P6	POINT	0.0	0.0	0.0				
LOCATION V1	VOLUME	0.0	0.0	0.0				
LOCATION V4	VOLUME	0.0	0.0	0.0				
LOCATION V7	VOLUME	0.0	0.0	0.0				
LOCATION V2	VOLUME	0.0	0.0	0.0				
LOCATION V5	VOLUME	0.0	0.0	0.0				
LOCATION V8	VOLUME	0.0	0.0	0.0				
LOCATION V3	VOLUME	0.0	0.0	0.0				
LOCATION V6	VOLUME	0.0	0.0	0.0				
LOCATION V9	VOLUME	0.0	0.0	0.0				
SRCPARAM P1	2.75E-05	3.66	291.0	0.0018	0.051			
SRCPARAM P2	3.47E-06	3.66	289.0	0.00022	0.051			
SRCPARAM P3	6.44E-06	3.66	291.0	0.0018	0.051			
SRCPARAM P4	8.13E-07	3.66	289.0	0.00022	0.051			
SRCPARAM P5	2.67E-08	3.66	291.0	0.0018	0.051			
SRCPARAM P6	3.38E-09	3.66	289.0	0.00022	0.051			
SRCPARAM V1	1.36E-05	1.0	3.02	2.33				
SRCPARAM V2	2.44E-05	0.0	3.02	2.33				
SRCPARAM V3	5.90E-07	1.0	3.02	2.33				
SRCPARAM V4	3.19E-06	1.0	3.02	2.33				
SRCPARAM V5	4.44E-05	0.0	3.02	2.33				
SRCPARAM V6	1.38E-07	1.0	3.02	2.33				
SRCPARAM V7	1.32E-08	1.0	3.02	2.33				
SRCPARAM V8	5.99E-06	0.0	3.02	2.33				
SRCPARAM V9	5.73E-10	1.0	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 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 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		

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

BUILDLEN	P5	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN	P5	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN	P5	10.26	10.87	11.16	11.11	10.72	10.00
BUILDLEN	P6	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN	P6	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN	P6	10.26	10.87	11.16	11.11	10.72	10.00
BUILDLEN	P6	10.72	11.11	11.16	10.87	10.26	9.33
BUILDLEN	P6	8.12	6.66	5.00	6.66	8.12	9.33
BUILDLEN	P6	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
XBADJ	P5	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P5	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P5	-5.13	-5.44	-5.58	-5.55	-5.36	-5.00
XBADJ	P5	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P5	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P5	-5.13	-5.44	-5.58	-5.55	-5.36	-5.00
XBADJ	P6	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P6	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P6	-5.13	-5.44	-5.58	-5.55	-5.36	-5.00
XBADJ	P6	-5.36	-5.55	-5.58	-5.44	-5.13	-4.67
XBADJ	P6	-4.06	-3.33	-2.50	-3.33	-4.06	-4.67
XBADJ	P6	-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
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	P6	0.00	0.00	0.00	0.00	0.00	0.00
URBANSRC	P1						
URBANSRC	P2						
URBANSRC	P3						
URBANSRC	P4						
URBANSRC	P5						
URBANSRC	P6						
URBANSRC	V1						
URBANSRC	V2						
URBANSRC	V3						
URBANSRC	V4						
URBANSRC	V5						
URBANSRC	V6						
URBANSRC	V7						
URBANSRC	V8						
URBANSRC	V9						
EMISFACT	P1	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	P1	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P1	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P1	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	P2	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	P2	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P2	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P2	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	P3	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	P3	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P3	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P3	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	P4	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	P4	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P4	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P4	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	P5	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	P5	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P5	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P5	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	P6	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	P6	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P6	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	P6	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V1	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V1	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V1	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V1	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V2	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V2	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V2	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V2	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V3	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V3	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V3	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V3	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V4	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V4	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V4	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V4	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V5	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V5	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V5	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V5	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V6	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V6	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V6	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V6	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V7	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V7	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V7	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V7	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V8	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V8	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V8	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V8	HROFDY	1.37	1.37	0.48	0.48	0.48
EMISFACT	V9	HROFDY	0.48	0.48	0.48	0.48	0.48
EMISFACT	V9	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V9	HROFDY	1.37	1.37	1.37	1.37	1.37
EMISFACT	V9	HROFDY	1.37	1.37	0.48	0.48	0.48
SRCGROUP	BE	P1	P2	V1	V2	V3	
SRCGROUP	EB	P3	P4	V4	V5	V6	

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

```
SRCGROUP NA      P5 P6 V7 V8 V9
SO FINISHED
RE STARTING
  GRIDPOLR POL1 STA
                ORIG 0.0 0.0
                DIST 34 59 84 109 209 309 509 1009
                GDIR 36 10.0 10.0
  GRIDPOLR POL1 END
RE FINISHED
ME STARTING
  SURFFILE AZUS_v9.SFC
  PROFFILE AZUS_v9.PFL
  SURFDATA 0 2010
  UAIRDATA 3190 2010
  SITEDATA 99999 2010
  PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
  RECTABLE ALLAVE 1ST
  RECTABLE 1 1ST
  PLOTFILE 1 BE 1ST AM1T1BE.TXT
  PLOTFILE 1 EB 1ST AM1T1EB.TXT
  PLOTFILE 1 NA 1ST AM1T1NA.TXT
  PLOTFILE PERIOD BE AM1T2BE.TXT
  PLOTFILE PERIOD EB AM1T2EB.TXT
  PLOTFILE PERIOD NA AM1T2NA.TXT
OU FINISHED
```

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

EXHIBIT XI - Sample AERMOD Input File for Spray Booths

```

CO STARTING
TITLEONE Spraybooth, 8-hour
MODELOPT CONC FLAT
AVERTIME 1 PERIOD
URBANOPT 9818605 LA
POLLUTID OTHER
RUNORNOT RUN
ERRORFIL Spraybooth.err
CO FINISHED
SO STARTING
LOCATION P1          POINT          0.000          0.000          0.0
LOCATION P2          POINT          0.000          0.000          0.0
SRCPARAM P1        0.0865        4.877         0.000         8.05709       0.864
SRCPARAM P2        0.0865        7.315         0.000         8.04963       0.864
BUILDHGT P1        3.05          3.05          3.05          3.05          3.05          3.05
BUILDHGT P1        3.05          3.05          3.05          3.05          3.05          3.05
BUILDHGT P1        3.05          3.05          3.05          3.05          3.05          3.05
BUILDHGT P1        3.05          3.05          3.05          3.05          3.05          3.05
BUILDHGT P1        3.05          3.05          3.05          3.05          3.05          3.05
BUILDHGT P1        3.05          3.05          3.05          3.05          3.05          3.05
BUILDHGT P2        5.49          5.49          5.49          5.49          5.49          5.49
BUILDHGT P2        5.49          5.49          5.49          5.49          5.49          5.49
BUILDHGT P2        5.49          5.49          5.49          5.49          5.49          5.49
BUILDHGT P2        5.49          5.49          5.49          5.49          5.49          5.49
BUILDHGT P2        5.49          5.49          5.49          5.49          5.49          5.49
BUILDHGT P2        5.49          5.49          5.49          5.49          5.49          5.49
BUILDWID P1        31.85         42.74         52.32         60.32         66.48         70.62
BUILDWID P1        72.62         72.41         70.00         72.41         72.62         70.62
BUILDWID P1        66.48         60.32         52.32         42.74         31.85         20.00
BUILDWID P1        31.85         42.74         52.32         60.32         66.48         70.62
BUILDWID P1        72.62         72.41         70.00         72.41         72.62         70.62
BUILDWID P1        66.48         60.32         52.32         42.74         31.85         20.00
BUILDWID P2        31.85         42.74         52.32         60.32         66.48         70.62
BUILDWID P2        72.62         72.41         70.00         72.41         72.62         70.62
BUILDWID P2        66.48         60.32         52.32         42.74         31.85         20.00
BUILDWID P2        31.85         42.74         52.32         60.32         66.48         70.62
BUILDWID P2        72.62         72.41         70.00         72.41         72.62         70.62
BUILDWID P2        66.48         60.32         52.32         42.74         31.85         20.00
BUILDWID P2        31.85         42.74         52.32         60.32         66.48         70.62
BUILDWID P2        72.62         72.41         70.00         72.41         72.62         70.62
BUILDLN P1        72.41         72.62         70.62         66.48         60.32         52.32
BUILDLN P1        42.74         31.85         20.00         31.85         42.74         52.32
BUILDLN P1        60.32         66.48         70.62         72.62         72.41         70.00
BUILDLN P1        72.41         72.62         70.62         66.48         60.32         52.32
BUILDLN P1        42.74         31.85         20.00         31.85         42.74         52.32
BUILDLN P1        60.32         66.48         70.62         72.62         72.41         70.00
BUILDLN P2        72.41         72.62         70.62         66.48         60.32         52.32
BUILDLN P2        42.74         31.85         20.00         31.85         42.74         52.32
BUILDLN P2        60.32         66.48         70.62         72.62         72.41         70.00
BUILDLN P2        72.41         72.62         70.62         66.48         60.32         52.32
BUILDLN P2        42.74         31.85         20.00         31.85         42.74         52.32
BUILDLN P2        60.32         66.48         70.62         72.62         72.41         70.00
XBADJ P1          -36.20        -36.31        -35.31        -33.24        -30.16        -26.16
XBADJ P1          -21.37        -15.93        -10.00        -15.93        -21.37        -26.16
XBADJ P1          -30.16        -33.24        -35.31        -36.31        -36.20        -35.00
XBADJ P1          -36.20        -36.31        -35.31        -33.24        -30.16        -26.16
XBADJ P1          -21.37        -15.93        -10.00        -15.93        -21.37        -26.16
XBADJ P1          -30.16        -33.24        -35.31        -36.31        -36.20        -35.00
XBADJ P2          -36.20        -36.31        -35.31        -33.24        -30.16        -26.16
XBADJ P2          -21.37        -15.93        -10.00        -15.93        -21.37        -26.16
XBADJ P2          -30.16        -33.24        -35.31        -36.31        -36.20        -35.00
XBADJ P2          -36.20        -36.31        -35.31        -33.24        -30.16        -26.16
XBADJ P2          -21.37        -15.93        -10.00        -15.93        -21.37        -26.16
XBADJ P2          -30.16        -33.24        -35.31        -36.31        -36.20        -35.00
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
URBANSRC ALL
EMISFACT P2      HROFDY 0.0 0.0 0.0 0.0 0.0 0.0

```

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RISK ASSESSMENT PROCEDURES FOR RULES 1401,1401.1 & 212**

```
EMISFACT P2          HROFDY 0.0 0.0 1.0 1.0 1.0 1.0
EMISFACT P2          HROFDY 1.0 1.0 1.0 1.0 0.0 0.0
EMISFACT P2          HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT P1          HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT P1          HROFDY 0.0 0.0 1.0 1.0 1.0 1.0
EMISFACT P1          HROFDY 1.0 1.0 1.0 1.0 0.0 0.0
EMISFACT P1          HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
SRCGROUP P1          P1
SRCGROUP P2          P2
SO FINISHED
RE STARTING
  GRIDPOLR GRID STA
    ORIG 0.00 0.00
    DIST 25 50 75 100 200 300 500 1000
    GDIR 36 0.00 10.00
  GRIDPOLR GRID END
RE FINISHED
ME STARTING
  SURFFILE E:\SCRAM\2017MetUpdate\Outputs\AZUS_v9.SFC
  PROFFILE E:\SCRAM\2017MetUpdate\Outputs\AZUS_v9.PFL
  SURFDATA 3102 2010
  UAIRDATA 3190 2010
  PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
  RECTABLE ALLAVE 1ST
  RECTABLE 1 1ST
  PLOTFILE 1      P1  FIRST  AM1T1P1.TXT
  PLOTFILE 1      P2  FIRST  AM1T1P2.TXT
  PLOTFILE PERIOD P1          AM1T2P1.TXT
  PLOTFILE PERIOD P2          AM1T2P2.TXT
  SUMMFILE Spraybooth.sum
OU FINISHED
```