VENTURA COUNTY APCD
AIR TOXICS "HOT SPOTS" PRIORITIZATION PROCEDURE

PURPOSE OF PROCEDURES

Under the Air Toxics "Hot Spots" Program (AB 2588), operators of certain facilities are required to prepare a comprehensive inventory of their releases of air toxics. Based on the air toxics emissions inventories, the District is required to "prioritize" facilities for health risk assessment. Facilities are categorized as high, intermediate, or low priority. High priority facilities are required to prepare health risk assessments. If the health risk assessment shows that there is a "significant risk" to the public due to air toxics emissions from a facility, the facility operator is required to notify the public of the results of the health risk assessment. Health risks may also be required to be reduced.

The District is required by state law to consider the following factors in setting priorities:

- Quantity of toxic air contaminants released
- Potency and toxicity of materials released
- Proximity of the facility to sensitive receptors
- Any other factors found by the District to indicate that the facility may pose a significant health risk to the public

PRIORITIZATION PROCEDURE

The procedure used by Ventura County to prioritize facilities consists of up to three steps. These are: 1) the emissions and potency procedure, 2) review of past health risk assessment, and 3) review of current health risk assessment.

Emissions and Potency Procedure

The emissions and potency procedure is used as the first step in all prioritizations. The emissions and potency procedure is outlined in the Air Toxics "Hot Spots" Program Facility Prioritization Guidelines, prepared by the California Air Pollution Control Officers Association (CAPCOA), July 1990. These guidelines were developed by a committee comprised of representatives from Districts (including Ventura County), the California Air Resources Board (CARB), and the Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA).

The emissions and potency procedure involves calculation of one or more numerical scores for a facility based on the following factors: emissions, potency or toxicity of compounds emitted, and receptor proximity. The procedure is designed to be straightforward and to be applied

consistently to every facility. Moreover, it assures that high risk facilities are ranked high priority.

The emissions and potency portion of the prioritization procedure is used to calculate numerical scores for each facility. Facilities receive one or more scores for potential effects: carcinogenic effects, chronic noncarcinogenic effects, and acute noncarcinogenic effects. Facilities are prioritized based on the highest of the calculated scores.

The emissions and potency score is calculated using emissions data from the air toxics emission inventory report submitted by the facility and toxicity data specified by OEHHA. For pollutants designated as "multipathway" compounds by OEHHA, a factor is used to modify the score. Multipathway compounds are substances that may be emitted to the air and subsequently deposited causing exposure through pathways other than inhalation, such as mother's milk, ingestion of contaminated soil, and dermal adsorption. The score is then modified to account for the distance from the facility to receptors: the more remote the facility, the lower the score.

A detailed description of the calculations used to determine the emissions and potency score is contained in Appendix A.

Facilities with scores less than or equal to 1 are categorized as low priority and facilities with scores greater than or equal to 10 are categorized as high priority. All other facilities are placed in the intermediate priority category. The basis for these thresholds is in Appendix B.

If, based on the emissions and potency procedure, the facility is not high priority, prioritization is complete, and the two additional steps described below are not required.

Review of Prior Health Risk Assessment

Emission inventories are required to be updated every four years. Based on updated emissions inventories, facilities are again prioritized for health risk assessment. For the second and subsequent rounds of prioritization, the District uses an additional procedure in order to reduce the burden on affected facilities. To eliminate unnecessary health risk assessments, the District considers the results of any previous health risk assessments in determining the need for updated health risk assessments.

If the updated facility score based on the emissions and potency procedure is in the high priority range, the facility is re-categorized intermediate priority if all of the following conditions are met:

1. The facility's most recent AB 2588 health risk assessment did not show the facility to be a significant risk;

2. Emissions from the facility either have not changed or have decreased;

3. Emissions of newly listed compounds from the facility will not increase calculated health risks; and

4. Release, receptor, or health effects data have not changed such that health risk of the facility might increase.

Review of Current Health Risk Assessment

If the facility score based on the emissions and potency procedure, or the combination of the emissions and potency procedure and review of the past health risk assessment, is in the high priority range, the facility may be re-categorized intermediate priority based on the District review of the required health risk assessment.

A health risk assessment must be performed by the facility operator in accordance with current guidelines and District policy. This may include a screening level health risk assessment, if appropriate. The health risk assessment must be submitted to the District for review. The District will review the results of the health risk assessment, including the emissions and dispersion modeling. Corrections to the emissions data and/or dispersion modeling may be required. If, based on the submitted health risk assessment, the District determines that emissions from the facility will not pose a significant risk, the facility will be re-categorized as intermediate priority. Under these circumstances, the health risk assessment will not be submitted to OEHHA for review. This will eliminate the cost of the OEHHA review, which is paid by the facility operator, for facilities that can demonstrate that their emissions do not cause a significant risk to the public through a health risk assessment. Overall AB 2588 compliance costs will therefore be reduced for some facilities, with no reduction in the technical quality of the work.

If, based on the results of the health risk assessment, the District determines that the facility may pose a significant risk, the facility will remain in the high priority category. The health risk assessment submitted to determine the facility priority will be considered to satisfy the requirements for preparation of a health risk assessment pursuant to California Health and Safety Code Section 44360(b)(1). The health risk assessment submitted will be forwarded to the Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA) for review prior to District approval pursuant to Health and Safety Code Section 44361(a).

LACK OF DATA

Any facility that has not yet submitted an approved emission inventory report to the District will initially be placed in the intermediate priority category. When the report is approved, the facility's priority will be redetermined. These facilities will be subject to enforcement action for failure to submit reports in a timely manner.

APPENDIX A

EMISSIONS AND POTENCY PROCEDURE SCORE CALCULATION

Under the emissions and potency procedure, facilities receive one or more numerical scores: potential carcinogenic effect, potential chronic noncarcinogenic effect, and potential acute noncarcinogenic effect.

The unit risk factors, acceptable exposure levels, and multipathway identifications to be used are contained in the current version of the CAPCOA Air Toxics "Hot Spots" Program Risk Assessment Guidelines. Values labeled as "screening" or "preliminary", or which OEHHA otherwise indicates are not recommended for use in prioritization, will not be used.

Carcinogenic Effects Score

For facilities that emit carcinogenic compounds, a facility score is calculated for carcinogenic effects according to the following equation:

$$TS = (\sum E_c P_c NI_c)(RP) 1.7 \times 10^3$$

Where:

TS = total facility score (carcinogenic effects)
c = specific carcinogenic substance
E_c = emissions of compound c, lbs/yr
P_c = unit risk factor for compound c
NI_c = non-inhalation exposure adjustment factor for compound c
NI = 10 for compounds identified by OEHHA as multipathway pollutants
NI = 1 for all other compounds
RP = receptor proximity adjustment factor (Table I)
1.7×10^3 = normalization factor (Appendix B)

Noncarcinogenic Effects

For facilities that emit compounds which have non-cancer health effects, facility scores are calculated for chronic and acute noncancer effects according to the following equation:

$$TS^* = (\sum E_t NI_t / P_t)(RP)(NF)$$

Where:

TS* = total facility score (chronic or acute non-carcinogenic effects)
t = specific toxic substance
E_t = emissions of compound t, lbs/hr (average or maximum)
NI_t = non-inhalation exposure adjustment factor for compound t
NI = 10 for chronic exposure to compounds identified by OEHHA as multipathway pollutants

NI = 1 for all other compounds and all acute exposures
P_t = acceptable exposure level of t, $\mu g/m^3$
RP = receptor proximity adjustment factor (Table I)
NF = normalization factor (Appendix B)
NF = 150 for chronic exposure
NF = 1500 for acute exposure

Receptor Proximity Factors

Table I Receptor Proximity Adjustment Factors	
Receptor Proximity (R, meters)	RP (dimensionless)
0 < R < 100	1
100 < R < 250	0.25
250 < R < 500	0.04
500 < R < 1000	0.011
1000 < R < 1500	0.003
1500 < R < 2000	0.002
R > 2000	0.001

The receptor proximity factor is used to reduce a facility's score if there are no receptors or potential receptors nearby. If there are receptors very nearby (< 50 m), the receptor proximity factor may increase a facility's score. The receptor proximity factors were based on the modeled change in concentration with distance for a release height of 5 meters.

The receptor proximity factor is based on the distance from the facility to the nearest receptor. A receptor may be a residence, school, day care center, hospital, or workplace; or an area zoned for these uses. The receptor proximity may be determined by adding the distance from the facility property line to the nearest receptor (or potential receptor) to the distance from the facility's nearest emitting source to the facility's property line. Alternatively, the receptor proximity may be determined by taking the distance from the facility's nearest emitting source to the nearest receptor. Where adequate information on the receptor proximity is not available, a

receptor proximity factor of 1 will be used in most cases. For facilities initially categorized as intermediate priority, receptor proximity will be examined further. Where there is a receptor less than 50 meters from the source, a receptor proximity factor of 4 will be used.

Multipathway Adjustment Factor

For pollutants identified by OEHHA as multipathway pollutants, the score for that pollutant is multiplied by a non-inhalation exposure adjustment factor of 10. This factor is to account for the additional exposure to air releases of the pollutants through pathways such as dermal exposure, soil ingestion, mother's milk, surface water ingestion, and food uptake and ingestion. This factor is based on results of previous multipathway risk assessments which have shown that exposure through non-inhalation pathways may be much greater than inhalation exposure. Factors of just over 1 to several orders of magnitude have been calculated. Ten was chosen as a reasonable mid-range value. The multipathway pollutants identified by OEHHA are listed in the current version of the CAPCOA Air Toxics "Hot Spots" Program Risk Assessment Guidelines.

Note that calculations for all substances or emission points may not be performed if it is determined that the facility will be ranked high priority based on partial calculations.

APPENDIX B

BASIS FOR EMISSIONS AND POTENCY THRESHOLDS

The following is an explanation of the basis for the numerical thresholds of 10 and 1 for high and low priority, respectively. It is not possible to determine health risk from a facility based on the calculated score using the prioritization procedure. Only upon completion of a comprehensive risk assessment will the risks posed by facilities be adequately characterized. However, using a conservative modeling scenario, the **maximum** risk associated with a certain score can be determined. Under this approach, facilities that do not significantly impact receptors may be identified as high priority. Facilities ranked as low priority can be considered insignificant risk facilities.

The thresholds were developed by first developing a relationship between the emission rate and the resulting maximum ambient concentration. A worst case "risk" can be determined based on the ambient concentration and data on the toxicity of the compounds in question. By using the relationship between emissions and concentration and the relationship between concentration and risk, a score based on emissions and toxicity of a compound was determined that corresponds to a specific level of risk.

The thresholds are based on conservative modeling performed by CARB staff using ISCST and PTPLU dispersion models. An emission rate of one pound per hour was modeled under various release scenarios, along with 49 combinations of wind speed and stability. The peak one-hour concentration at the maximum impacted receptor was determined. The highest modeled peak one-hour concentration was 1,458 $\mu g/m^3$. This peak concentration occurred approximately 50 m downwind of a release at a height of 1 m for D stability and a wind speed of 0.5 m/s.

The peak one-hour concentration of 1,458 $\mu g/m^3$ was multiplied by an ARB scaling factor of 0.1 to estimate a peak annual average concentration of 145.8 $\mu g/m^3$. The annual average concentration varies linearly with the emission rate. Based on this result, it was determined that an emission rate of approximately 60 lb/yr corresponds to a peak annual average concentration of 1 $\mu g/m^3$. That is, under most circumstances an emission rate of 60 lb/yr would result in an annual average concentration of less than 1 $\mu g/m^3$ at a distance of 50 m or more from the release.

With CARB's calculated relationship between emission rate and concentration, a minimum score (threshold) associated with a specific level of risk can be determined. Facilities with lower scores than the threshold are expected to result in lower risks than the level from which the threshold was derived. Facilities with higher scores do not necessarily result in higher risks, however, because of the very conservative modeling scenario used.

The potential excess cancer risk is calculated by multiplying the average annual pollutant concentration by the "unit risk factor", which is expressed as lifetime excess cancer risks for exposure to a pollutant concentration of 1 $\mu g/m^3$. The facility score has been defined, in part as

the product of the emission rate and the unit risk factor. A score corresponding to an excess cancer risk of one in a million can be calculated by using the fact that an emission rate of 60 lb/yr results in an annual average concentration of 1 $\mu g/m^3$ at a distance of 50 m under our conservative modeling scenario. A calculated excess cancer risk of one in a million results under these assumptions if the score (emissions x unit risk factor) is 60×10^{-6}. To put the score on a more convenient scale, use of a normalization factor of 1700 equates a score of 0.1 to a "risk" of one in a million. Similar scores and normalization factors can be identified for non-carcinogens based on the relationship between emission rate and the peak annual concentration for chronic health effects and the peak one hour concentration for acute health effects based on chronic and acute noncancer "reference exposure levels" developed by OEHHA.

For the conservative modeling scenario used, a score of 10 approximately translates to a risk of 100 in a million for carcinogens and ten times the acceptable exposure level for non-carcinogens. However, facilities with considerably lower risks (over two orders of magnitude) may also receive scores of 10 or more and be designated as high priority. It is possible that facilities with higher risks could receive scores of less than 10. This is most likely in cases where the facility is very close (< 50 m) to the receptor. The District therefore uses a receptor proximity factor of 4 for facilities initially ranked intermediate that have a receptor less than 50 m away. This factor was developed by Bay Area Air Quality Management District staff based on modeling similar to that described above.

The low priority threshold of 1 corresponds to a risk of ten in a million for carcinogens and the reference exposure level for non-carcinogens, based on the conservative modeling scenario. Facilities that have scores greater than 1 may actually result in risks considerably less than 10 in a million. Because of the conservative nature of the modeling scenario facilities with scores less than 1 are not expected to result in risks greater than 10 in a million for carcinogens and the reference exposure level for non-carcinogens.