SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

DRAFT STAFF REPORT

Proposed Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document

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I. SUMMARY

On June 20, 2014, the state Office of Environmental Health Hazard Assessment (OEHHA) proposed changes to *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments* (Risk Assessment Guidelines). These revisions are designed to provide enhanced protection of children, as required under state law, The Children's Environmental Health Protection Act (SB 25, Escutia, 1999), and incorporate three technical support documents developed in 2008 through 2012.

On September 19, 2013, District staff provided an update to the Governing Board on these activities, in anticipation of OEHHA's release of the proposed changes. The Governing Board provided direction to staff to develop revisions to the District's risk management policies that do all of the following:

1. Incorporate all portions of the state Office of Environmental Health Hazard Assessment's (OEHHA's) revised Risk Assessment Guidelines designed to provide enhanced protection of children.
2. Adjust permitting risk thresholds, as necessary, to prevent unreasonable restrictions on permitting of stationary sources and California Environmental Quality Act (CEQA) projects while preventing any relaxations of current health protections.
3. In order to enhance the public's right-to-know, and health protection, retain the District's current public notification and health risk reduction thresholds used in implementing the Air Toxics "Hot Spots" Information and Assessment Act.
4. Incorporate all possible streamlining of the health risk assessment process to minimize administrative costs and burden to Valley businesses.
5. Develop effective outreach tools and processes to communicate with communities and businesses regarding revised procedures and risk estimates.

The District must immediately implement, in the District's AB 2588 program the changes to the Risk Assessment Guidelines upon final OEHHA approval, expected in November of 2014. In preparation to implement the Governing Board's direction, staff has prepared the following staff report and analysis of the proposed changes, and requests comments in a variety of areas. Comments are due November 8, 2014.

II. BACKGROUND

Historically, state laws have required the OEHHA to develop Risk Assessment Guidelines for estimating health risk associated with various sources of air pollution. The District utilizes these guidelines for the following purposes:

- Permitting of New and Modified Stationary Sources
- Establishing a Project's Significance Under CEQA
- Implementation of the Air Toxics "Hot Spots" Information and Assessment Act

The Children's Environmental Health Protection Act (SB 25, Escutia, 1999) requires OEHHA to biennially review risk assessment methods for air toxics, and related information, to ensure that they adequately protect infants and children.

In mid-2013, OEHHA released draft changes to methods of determining health risks for people exposed to hazardous air pollutants with enhanced protection of children. Initial District assessments indicated that the changes would more than double the calculated risk, as compared to the current methodology, for identical projects.

The District's current risk management policies are rooted in the risk assessment methodologies contained in the current Risk Assessment Guidelines. Failure to update the District's risk management policies as these underlying guidelines changed could have serious impacts on the ability of facilities to obtain Air District permits and could cause significant confusion and concern for many stakeholders. Therefore, District staff informed the Governing Board of the revisions and its impacts, with recommendation to incorporate all portions of the OEHHA's revised Risk Assessment Guidelines.

On September 19, 2013, the Governing Board approved the recommendation and requested that District staff thoroughly evaluate the impacts of the revisions and provide recommendation for adjusting permitting risk thresholds, as necessary, to prevent unreasonable restrictions on permitting of stationary sources and California Environmental Quality Act (CEQA) projects while preventing any relaxations of current health protections.

III. AIR TOXICS HEALTH RISK REDUCTION IN THE SAN JOAQUIN VALLEY

Although the new methodology will result in higher calculated risk, it is indisputable by any measure that the Valley residents' exposure to hazardous air pollution and the actual health risks have been significantly reduced.

The District's comprehensive regulatory and incentive-based programs discussed below, combined with state and federal air toxic control regulations, have significantly reduced the public's exposure to air toxics over the past two decades. Figure 1 below illustrates the significant health benefit that the Valley residents have experienced, as represented by both the current methodology and the draft new methodology. The blue line represents the historical context, using the Health Risk Assessment (HRA) methodologies in place since the mid-1990s and still used today. The cancer risk as calculated using these methodologies has dropped from about 1200 in a million in 1990, to under 200 in a million today. The red line indicates the impact currently expected by using the newly proposed OEHHA methodologies. Note the new methodologies result in much higher calculated risk (at least 2.3 times higher), but regardless of the methodology used, the San Joaquin Valley has seen a reduction of about 85% in cancer risk due to air toxics during the last two decades. As we move forward, it is important to recognize that although the risk calculation methodology is changing, and will result in higher calculated risk, the apparent increase in risk is not caused by increases in actual emissions or exposures to toxic air contaminants.

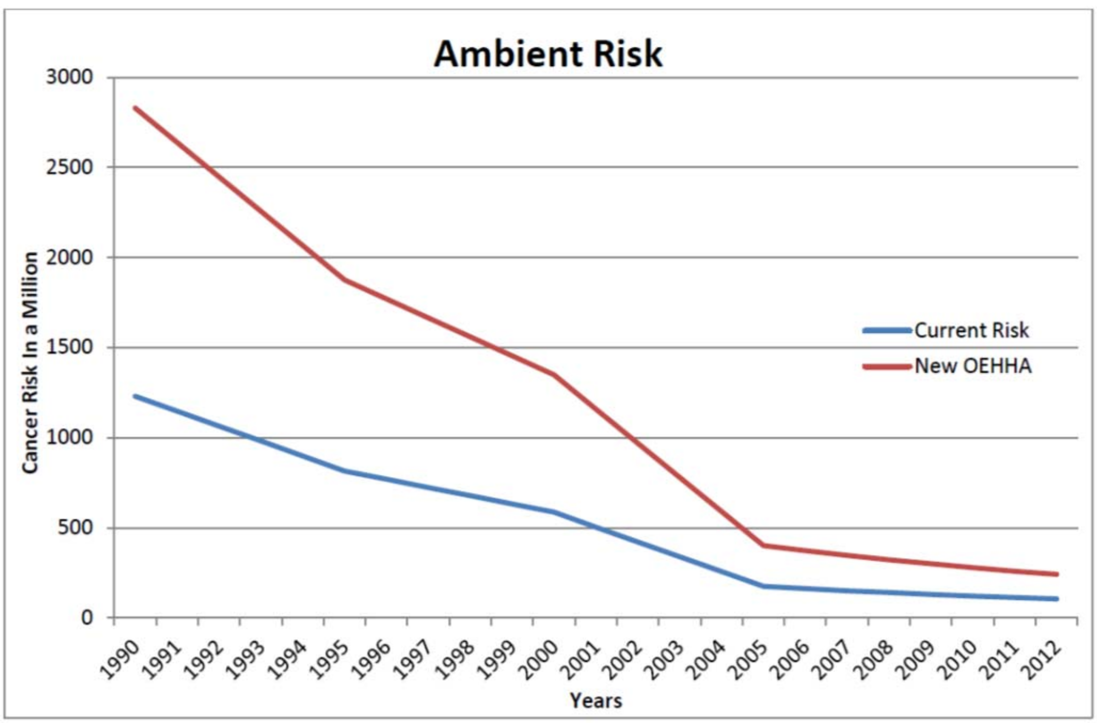


Figure 1 – Cancer Risk from Ambient Air, San Joaquin Valley (The California Almanac of Emissions and Air Quality, CARB, 2009)

The following are the key components of the District's air toxics health risk reduction strategies:

A. Permitting of New and Modified Stationary Sources

One goal of District risk management efforts is to ensure that new and modified sources of air pollution do not introduce new and unacceptable health impacts to nearby residences and businesses. In order to achieve this goal, the District reviews the impacts associated with each proposed permitting action where there is an increase in emissions of hazardous air pollutants. This risk management review is performed by expert District staff as part of the project evaluation. Risk management reviews are performed concurrently with other project review functions using streamlined procedures including improved modeling tools developed by District staff, appropriate EPA-approved modeling programs, and the most current and applicable meteorological data processed by District staff.

In 1995, the District developed its risk management policy (Policy APR-1905). Under this policy, Toxic Best Available Control Technology must be applied to all units that may pose greater than de minimus levels of risk (i.e., a cancer risk greater than one in one million). Projects that would pose significant impacts to nearby residences or businesses (i.e., a cancer risk of greater than 10 in one million) are not approvable. When a project is determined not to be approvable as proposed, District staff will work with the applicant to find approvable low-risk alternatives, such as installing control devices for air toxic emissions or modifying the operation or design of the proposed equipment.

Under this program, the District has performed over 11,000 Risk Management Reviews for over 6,538 facilities throughout the valley. As a consequence, no permit for a new or modified operation has been approved that would have created a significant health impact through increases in air toxic emissions since the program was initiated in 1995.

B. Air Toxics "Hot Spots" Information and Assessment Act (AB2588)

This law is designed to provide information on the extent of emissions from existing stationary sources and the potential public health impacts of those emissions. Facilities are required to calculate and report to the District their actual emissions of air toxic emissions. "Significant Risk" facilities must hold public hearings to disclose their impacts to the nearby residents that may be impacted. Facilities that exceed a higher risk reduction action threshold must go even further and reduce emissions of air toxics through implementation of a risk reduction plan. In 1993, the Governing Board set the AB2588 public notification and public meeting thresholds at 10 in a million for cancer risk and for non-cancer acute or chronic risk a hazard index of one. The Board also set the risk reduction action thresholds to 100 in a million for cancer risk and at 5 for non-cancer acute or chronic hazard index.

Under this law, the District has worked with Valley facilities to quantify emissions of air toxics, determine the health impacts caused by those emissions, report emissions and any significant risks through written public reports and neighborhood public meetings, and take steps to reduce such risks. As a result of these efforts, and the resulting emissions reductions, no Valley facility currently poses a significant risk under the “Hot Spots” program since 2007, while at the beginning of the implementation of the program, in 1989, 16 facilities were classified “Significant Risk Facilities” (Figure 2 below).

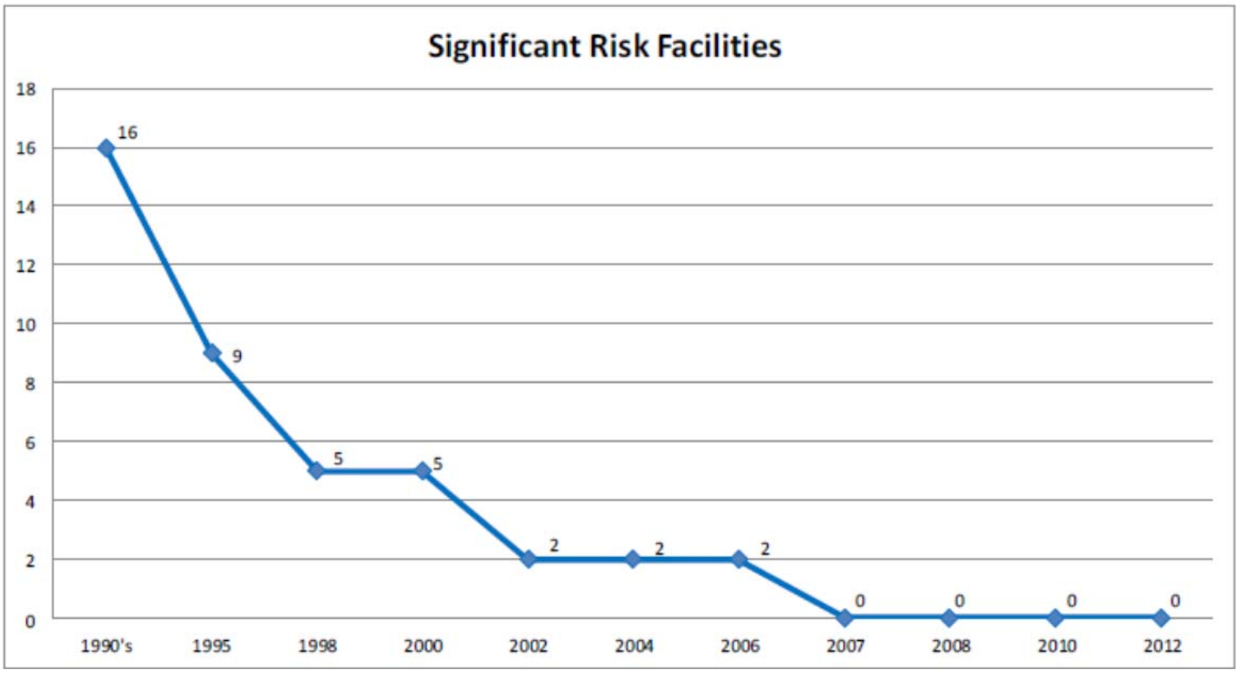


Figure 2 – Number of Significant Risk Facilities

C. Incentive-Based Programs

The District has experienced tremendous success in replacing and retrofitting large numbers of polluting equipment in the San Joaquin Valley, through our emissions reduction incentive grant programs. A significant portion of the emissions reductions achieved have been from the replacement or electrification of over 6,200 diesel fired internal combustion engines. These programs have reduced nitrogen oxide emissions by over 10,000 tons NOx per year. In addition, they have directly reduced nearly 400 tons per year of diesel particulate emissions, one of the most potent and common carcinogens in the ambient air. This reduction in diesel particulate has resulted in an estimated reduction in cancer risk of over 180 in a million for the residents of the San Joaquin valley – to put this in context, the current risk of an individual contracting cancer caused by the diesel particulate in the air in the San Joaquin Valley is approximately 40 in a million.

D. Air Toxics Regulations

In addition, the District implements a variety of state, federal, and District rules reducing and regulating the emissions of toxic air pollutants. Such regulations have generated significant reductions in air toxics from a wide variety of sources, from requiring the gradual phase-out of perchloroethylene used at drycleaners and mandating emissions controls at chrome platers, to a large number of rules aimed at reducing particulate emissions from diesel internal combustion engines. This latter set of regulations has also been partially responsible for the significant reduction in the chance that diesel combustion particulates in the ambient air will cause cancer in an individual. Between our incentive-based programs, the state's diesel particulate reduction regulations, equipment attrition and modernization, the calculated risk of an individual contracting cancer caused by the diesel particulate in the air dropped from nearly 800 in a million in 1990, to about 40 in a million in 2012, a reduction of 95% (The California Almanac of Emissions and Air Quality, CARB, 2009).

Due to this diverse set of risk reduction efforts only nine percent (9%) of all air toxics in the San Joaquin Valley are now emitted from stationary sources of pollution under the direct control and regulation of the District, while 66% come from mobile sources such as cars and trucks. The remaining 25% is emitted from area-wide sources like road dust, paint and solvent use, and other consumer products. Mobile and area-wide sources of emissions are generally under the regulatory authority of the State of California and the federal government.

IV. OEHHA'S PROPOSED CHANGES TO THE RISK ASSESSMENT GUIDELINES

The key changes to the proposed Risk Assessment Guidelines, along with the resulting changes to the District's risk assessment techniques, are summarized as follows.

A. Years of Exposure

OEHHA has recommended changing the exposure duration currently being used for estimating cancer risk at the maximum exposed individual receptor (MEIR) in all health risk assessments from 70 years of exposure to 30 years of exposure. Additionally, they recommend using the 9 and 70-year exposure duration to represent the potential impacts over the range of residency periods. Population-wide impacts would stay the same and use the 70-year exposure duration.

B. Age Groups or Bins

Under the current methodology, the health risk estimated assuming the exposed individual lives for 70 years at a given calculated concentration of the pollutants. As part of the OEHHA effort to revise their HRA methodology, they have disaggregated this single exposure methodology. The new disaggregated methodology allows for exposure estimates to be determined by age group.

OEHHAs Technical Support Document for Cancer Potency Factors (OEHHA, 2009) recommends that risk be calculated by age groups specifically for the third trimester to age zero, ages zero to less than two, ages two to less than nine, ages two to less than 16, ages 16 to less than 30, and ages 16 to 70 (depending on approach). This would allow calculation of risk for age groups, as the exposure varies with age. It also allows for application of Age Sensitivity Factors for early life exposures.

Age Groups (Bins)						
Current	70yr (Resident), 9yr (Children), & 40yr (Worker)					
New OEHHA Guidance	Trimester	0<2	2<9	2<16	16<30	16-70

C. Age Sensitivity Factors (ASF)

Studies have shown that young animals are more sensitive than adult animals to exposure to many carcinogens (OEHHA, 2009). Therefore, OEHHA developed age sensitivity factors (ASFs) to take into account the increased sensitivity to carcinogens during early-in-life exposure. The current risk method does not provide for any adjustment to account for the increases in sensitivity at the early stages of life.

The revised cancer risk methodology takes into account revised age sensitivity factors (ASF) by age groups. These factors have been approved by a state multidisciplinary scientific review panel (SRP) and were subsequently adopted by OEHHA to account for scientific studies that have shown that infants and young children have a higher sensitivity to cancer causing chemicals. The ASF utilized in the new OEHHA guidance document provide a 10-fold multiplier in exposure to infants (3rd Trimester to age 2) and a 3-fold increase in exposure for children (ages 2 to 16 years old). Ages 16 and older have an exposure factor of 1.

Age Sensitivity Factors			
Current Adjustment		Age Group	Age Sensitivity Factor
0-70 yr	1	3rd Trimester	10
		0<2 years	10
		2<9 years	3
		2<16 years	3
		16<30 years	1
		16-70 years	1

D. Breathing Rates

In addition to the increased sensitivity noted above, children are also generally subject to higher air toxic exposures. Children breathe more rapidly and consequently inhale more air per body weight than adults, and they generally spend significantly more time outdoors than adults. Children also breathe through their mouths, bypassing the filtering effect of the nose and allowing more pollutants to be inhaled. OEHHA has also added an additional layer of conservativeness by adjusting for age-based breathing rates. OEHHA also proposed that the 95th percentile breathing rate be used to determine an individual's total inhalation, rather than the 80th percentile used in the prior approved methodology. A 95th percentile breathing rate means that only 5% of a given population breathes at a higher rate.

Long-Term Daily Breathing Rates (L/kg-day)							
		Trimester	0<2	2<9	2<16	16<30	16-70
Current	Adult 95th	NA	393				
	Adult 80th		302				
	Children		581		NA		
Proposed New OEHHA							
Adult	Mean	225	658	535	452	210	185
	95^{th}	361	1090	861	745	335	290
	95^{th} / 80^{th}	273	758	631	572	261	233
Worker / Children	Mean	170	890	470	380	170	170
	95^{th}	240	1200	640	520	240	230

E. Uncertainty Factors for Reference Exposure Levels (8-hour values)

Inhalation Reference Exposure Levels (RELs) are air concentrations or doses at or below which adverse noncancer health effects are not expected even in sensitive members of the general population under specified exposure scenarios. When developing a (REL), where the study is insufficient to directly establish a REL, a “No-Observed-Adverse-Effect-Level” (NOAEL) may be established – a concentration where adverse effects are observable rarely, or not at all, in a specific study. However, this level may not be without effect among the general human population, which includes individuals who are more sensitive than average, or who may receive repeated or extended exposures, and so RELs are generally established at some lower level than the NOAEL. The REL must also address, and where possible quantify, uncertainties in the available data and variability in the target population. These issues are accounted for by means of explicit extrapolation models, where these are available and appropriate input data can be obtained. Where these explicit models are unavailable, Uncertainty Factors (UFs) have been used extensively with human or animal toxicity data to estimate “safe” or “acceptable” exposure levels for humans.

UFs are used by OEHHA in deriving RELs to account for:

1. the magnitude of effect observed at a LOAEL (Lowest Observed Adverse Effect Level) compared with a NOAEL;
2. for chronic RELs, the potentially greater effects from a continuous lifetime exposure compared to a short term, subchronic exposure;
3. the potentially greater sensitivity of humans relative to experimental animals not accounted for by differences in relative inhalation exposure;
4. the potentially increased susceptibility of sensitive individuals, for example due to inter-individual variability in response, or children versus adults; and
5. other deficiencies in the study design.

Individual uncertainty factors range from 2 to 10, depending on the limitations in the data, and are multiplied together for a total uncertainty factor, and this total UF is used to divide the NOAEL to arrive at a very conservative REL. The use of uncertainty factors in the development of a REL for a given pollutant helps ensure that the REL is protective for nearly all individuals, including sensitive subpopulations, within the limitations of current scientific knowledge.

It should be emphasized that exceeding the acute or chronic REL does not necessarily indicate that an adverse health impact will occur. However, levels of exposure above the REL have an increasing but undefined probability of resulting in an adverse health impact, particularly in sensitive individuals (e.g., depending on the toxicant, the very young, the elderly, pregnant women, and those with acute or chronic illnesses).

For detailed information on the methodology and derivations for RELs, see the Air Toxics Hot Spots Risk Assessment Guidelines Technical Support Document for the Derivation of Noncancer Reference Exposure Levels (OEHHA, 2008). This document is being used by OEHHA in their efforts to update RELs to provide protective action levels for nearly all individuals, including infants and children. While this effort is not directly a part of the new OEHHA risk assessment guidelines, the RELs developed are used in HRA modeling for determining non-cancer chronic and acute risks, and are an important part of OEHHA's efforts to develop HRA methodologies that are protective of infants and children. The District is already implementing the updated RELs as they are finalized via the OEHHA approval process, and will continue doing so in the future.

F. Fraction of Time at Home

OEHHA and ARB evaluated information from activity patterns databases to estimate the fraction of time at home (FAH) during the day (OEHHA, 2012). This information can be used to adjust exposure duration and cancer risk from a specific facility's emissions, based on the assumption that exposure to a facility's emissions are not occurring when a person is away from their home.

Fraction of Time at Home	
Age Range	**Adjustment Factor**
3rd Trimester to less than 2 years	0.851
2 to less than 16 years	0.721
16-70 years	0.73

G. Worker Exposure Duration (40 yrs vs 25 yrs)

OEHHA has recommended changing the exposure duration currently being used for estimating cancer risk for a work site from 40 years of exposure to 25 years of exposure for all health risk assessments.

H. Worker Modeled Concentration Adjustment

OEHHA has recommended adjusting the modeled concentration depending on the exposure duration. In this case, it is dependent on how the facility under evaluation overlaps with the off-site worker schedule. These values should only be used as a screen method.

Worker Modeled Concentration Adjustment		
Off-Site Workers' Shift Overlap with Facility's Emission Schedule[a]	**Facility Operating Schedule**	**Adjustment Factor**
8 hrs/day, 5 days/week	Continuous (24 hrs/7 days/week)	1.0
8 hrs/day, 5 days/week[b]	Non-continuous (8 hrs/5 days/week)	4.2
4 hrs/day, 5 days/week	Non-continuous (8 hrs/5 days/week)	2.1

a Worker works 8 hours per day, 5 days per week
b Workers' work hours completely overlaps the facilities operating hours

I. Dispersion Model Change (EPA's AERMOD)

OEHHA's revised guidance recommends using EPA preferred model AERMOD for conducting health risk assessments. CARB's current risk module in HARP uses the ISCST3 model. The San Joaquin Valley Air District has required AERMOD to be used when conducting health risk assessments for AB2588, permitting activities, and CEQA projects submitted by consultants since 2006, when EPA promulgated AERMOD as their preferred model.

Since 2006, AERMOD and its supporting programs have gone through numerous changes and updates. The most recent and most significant changes have been the use of the 1-minute data. The use of the 1-minute data has the potential to cause an increase in modeled concentration.

Note that the District was one of the first agencies in the country to incorporate and require the use of AERMOD. District staff members are considered the leading statewide experts in the field of dispersion modeling, and have developed significant resources, from guidance documents to database tools, to assist other agencies, consultants, and regulated sources to implement AERMOD. In fact, CARB's Enforcement Division is utilizing these resources, and training modules developed by the San Joaquin Valley Air District, to teach other agencies how to use AERMOD and assess risk.

J. Spatial Averaging

OEHHA's revised guidance provides for an option of using spatial averaging to determine a project's risk. The District's currently utilizes a more health-protective approach which does not use spatial averaging when determining a project's maximum impact to nearby residents. Spatial averaging is a technique used to estimate the overall impact on a given receptor by averaging its receptor concentration with other nearby receptor concentrations, and is generally applicable to small footprint sources. This technique generally, but not always, results in a lower calculated risk than non-spatial averaging techniques.

K. Poly Aromatic Hydrocarbons (PAH), Creosotes & Lead

OEHHA's revised guidance will now include PAHs, Creosotes, and Lead as multi-pathway pollutants that affect the ingestion of Mothers Milk pathway. In the previous risk assessment guidance from OEHHA, PAHs, Creosotes, and Lead were considered multi-pathway pollutants that did not affect the ingestion of Mothers Milk pathway.

V. DISCUSSION

The proposed OEHHA changes contain several efforts to be more protective of children's health. These efforts generally result in a higher calculated risk than OEHHA's current methodology. OEHHA has also proposed several changes that would tend to reduce calculated risk. The District has historically used the most health-protective assumption in its risk assessment methodologies, including many of the more health-protective measures now being proposed in the OEHHA's proposed changes to the Risk Assessment Guidelines. For instance, the District's program uses the 95th percentile breathing rate now being proposed by OEHHA as the new preferred assumption, while OEHHA's current methodology and other risk assessment policies allow the use of a less conservative and less health-protective 80th percentile breathing rate.

Some of the OEHHA proposed updates, such as recommending a residential exposure period of 30 years rather than the current 70 year period, will result in a reduction of calculated risk. Similarly, using the suggested occupational exposure of 25 years or using spatial averaging may, under some circumstances, also result in a reduction in calculated risk. Historically, the District has used the more conservative and more health-protective assumptions for residential and occupational exposures of 70 years and 40 years, respectively.

The increase in calculated risk, if implemented without careful consideration of the implications and consequences, has the potential to significantly delay or even prevent the permitting of many common types of operations, such as gas stations, emergency engines, and automotive body shops, while simultaneously causing significant confusion about health risk impacts amongst concerned residents of the San Joaquin Valley. In addition to the potential impact on economic growth in the San Joaquin Valley, it's important to note that many of these units, such as emergency engines, are necessary components of operations essential for human health and safety, like hospitals, jails, and communication systems.

Therefore, the purpose of this analysis is to thoroughly evaluate the impacts of the revisions and of potential adjustments to permitting risk thresholds, as necessary, to implement the Governing Board's direction to incorporate all proposed additional protections of children and prevent unreasonable restrictions on permitting of stationary sources while also preventing any relaxations of current health protections.

VI. ANALYSIS

A. General Discussion

This analysis was conducted to identify to what extent the impact of the proposed new OEHHA risk assessment methodology would have on the issuance of Authority to Construct (ATCs) and CEQA significance determinations.

B. Methodology

In order to develop an appropriate adjustment factor, a comparison of the current 2003 OEHHA risk assessment procedures and the proposed OEHHA risk assessment procedures must be completed. The most significant changes to OEHHA risk assessment procedures are described in Section IV entitled "OEHHA'S DRAFT CHANGES TO THE RISK ASSESSMENT GUIDELINES" of this document. This comparison will be made using the District's current conservative risk procedure with the following parameters:

Current Risk Method
- 70 year exposure period
- 95th percentile breathing rate

First Cut Analysis under Board Guidance
This first cut analysis was prepared as the initial attempt to meet the Board mandates to incorporate the proposed additional protection of children and to prevent unreasonable restrictions on permitting of stationary sources while also preventing any relaxations of current health protections:
- 70 year exposure period
- 95th percentile breathing rate for all age groups (bins)
- Age Sensitivity Factor (ASF) for all age groups (bins)

Other assessments were also conducted to assess the full impact of the proposed OEHHA changes that tended to reduce calculated risk:
- 30 year period using 95th percentile breathing rate.
- 30 year period using 95th percentile breathing rate for children and 80th percentile breathing rate for adults (95/80th percentile breathing rate).

- 70 year period using 95/80th percentile breathing rate. This scenario was added to be able to compare a 30 year vs 70 year risk.

The basic steps of this methodology are as follows:
- Conduct modeling runs for selected source types and scenarios
- Use modeling runs to estimate risk
- Compare risk from current method to other scenarios
- Summarize results

C. Modeling

Modeling runs were conducted for several of the more common sources for which the District issues Authorities to Construct (ATC): diesel / natural gas internal combustion engines, gasoline dispensing operations, boilers and steam generators. Modeling runs were conducted for each of these source types including the following parameters:
- Each of the 20 meteorological sites in the San Joaquin Valley for which AERMOD data is available
- A polar grid extending out to 10 kilometers was used to ensure the maximum impact was identified
- Rural and Rural with Building Downwash
- Urban and Urban with Building Downwash

The District utilized EPA's preferred model AERMOD version 14134 for conducting modeling runs used in this analysis. The District has required AERMOD to be used when conducting health risk assessments for AB2588, permitting activities, and CEQA projects submitted by consultants since 2006, when EPA promulgated AERMOD as their preferred model. A detailed list of modeling input can be found in Appendix A.

D. Estimating Risk

Once all the modeling runs were complete (~160 modeling runs, resulting in analysis of 3,760 individual sources of toxic emissions), the data was condensed to determine the maximum modeled concentration by quadrant and distance. This data was further condensed to determine the maximum modeled concentration by distance only.

Using the maximum modeled concentrations at each distance modeled; the risk from each source type was estimated for both the current method see Equation 1-Benzene and the proposed new OEHHA methodology, see Equation 2- Benzene. It must be noted that equation 1 and 2 only describe the method for estimating inhalation risk. A detailed explanation of multi-pathway risk estimation can be found in the 2003 and proposed 2014 "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments".

For Inhalation, the risk is estimated by taking the value derived in equation 1 multiplied by the sum of the modeled concentration multiplied by a pollutant's emissions in grams per sec.

<u>Current Method</u>
Risk $_{\text{Inhalation}}$ = 95th Risk Factor from Eq1 * (Modeled Concentration * Emissions in g/sec)

<u>Proposed OEHHA Method</u>
Risk $_{\text{Inhalation}}$* = Risk-air from Eq2 * (Modeled Concentration * Emissions in g/sec)

- This procedure is repeated for each age group under consideration
- Summing all the values to determine the total impact

The above process was repeated for each of the four modeling scenarios, distance modeled, and source type under consideration to determine the maximum potential impact.

Equation 1- Benzene: Current Risk Methodology (Inhalation Only)

	Current Method			
	Dose = (Cair * DBR * EF * ED * CF) / AT			
	where:			
		Dose = dose through inhalation (mg/kg-day)		
	1	Cair = air concentration (µg/m3) from air dispersion model (normalized air concentration of 1 ug/m3 is used)		
	393	DBR 95th = daily breathing rate		
	302	DBR 80th = daily breathing rate		
	350	EF = exposure frequency (350 days/year)		
	70	ED = exposure duration (70 years)		
	1.00E-06	CF = conversion factor (10-6 ([mg/µg] * [m3/L])		
	25,550	AT = averaging time (25,550 days or 70 years)		
	95th	80th		
Dose =	3.77E-04	2.90E-04		
	Cancer Risk = (Dose * Cair * Toxic Emissions * Cancer Potency Factor)			
		Cancer Risk = risk (potential chances per million)		
	where:			
	---	Dose = dose through inhalation (mg/kg-day)		
	1	Cair = air concentration (µg/m3) from air dispersion model (normalized air concentration of 1 ug/m3 is used)		
	1	Toxic Emissions = Sum of the toxic pollutant under review (g/sec)		
	1.00E-01	Cancer Potency Factor (Slop)= toxicity factor (mg/kg-day-1)		
(1 µg/m3) of Benzene =		95th	80th	%
		3.77E-05	2.90E-05	77%

Equation 2- Benzene: Proposed New OEHHA Methodology (Inhalation Only)

B. CANCER RISK CALCULATION

Eq. 5.4.1.1: Dose-air=Cair*DBR*A*(EF/365)*10^-6

Eq. 8.2.3: Risk-air=Dose-air*CPF*ASF*ED/AT*FAH

FAH - Fraction of time at home. Facilities with a school within the 1x10^-6 (or greater) cancer risk isopleth should use 1 as the fraction of time at the residence for ages 3rd trimester to less than age 16

70 year Risk Calcs. (95th)

3rd Trimester		
GLC Adjustment Factor	1	
Cair:	1.000	ug/m^3
DBR:	361	L/kg-day
A:	1	
EF:	350	days/year
Conversion Factor:	365	days/year
Conversion Factor:	0.000001	mg*m^3/ug*L
Dose-air:	3.46E-04	mg/kg-d
CPF:	0.1	kg-d/mg
ASF:	10	
ED:	0.25	years
AT:	70	years
FAH:	1	
Risk-air:	1.24E-06	

0<2		
GLC Adjustment Factor	1	
Cair:	1.000	ug/m^3
DBR:	1090	L/kg-day
A:	1	
EF:	350	days/year
Conversion Factor:	365	days/year
Conversion Factor:	0.000001	mg*m^3/ug*L
Dose-air:	1.05E-03	mg/kg-day
CPF:	0.1	kg-d/mg
ASF:	10	
ED:	2	years
AT:	70	years
FAH:	1	
Risk-air:	2.99E-05	

2<9		
GLC Adjustment Factor	1	
Cair:	1.000	ug/m^3
DBR:	861	L/kg-day
A:	1	
EF:	350	days/year
Conversion Factor:	365	days/year
Conversion Factor:	0.000001	mg*m^3/ug*L
Dose-air:	8.26E-04	mg/kg-day
CPF:	0.1	kg-d/mg
ASF:	3	
ED:	0	years
AT:	70	years
FAH:	1	
Risk-air:	0.00E+00	

2<16		
GLC Adjustment Factor	1	
Cair:	1.000	ug/m^3
DBR:	745	L/kg-day
A:	1	
EF:	350	days/year
Conversion Factor:	365	days/year
Conversion Factor:	0.000001	mg*m^3/ug*L
Dose-air:	7.14E-04	mg/kg-day
CPF:	0.1	kg-d/mg
ASF:	3	
ED:	14	years
AT:	70	years
FAH:	1	
Risk-air:	4.29E-05	

16<30		
GLC Adjustment Factor	1	
Cair:	1.000	ug/m^3
DBR:	335	L/kg-day
A:	1	
EF:	350	days/year
Conversion Factor:	365	days/year
Conversion Factor:	0.000001	mg*m^3/ug*L
Dose-air:	3.21E-04	mg/kg-day
CPF:	0.1	kg-d/mg
ASF:	1	
ED:	0	years
AT:	70	years
FAH:	1	
Risk-air:	0.00E+00	

16-70		
GLC Adjustment Factor	1	
Cair:	1.000	ug/m^3
DBR:	290	L/kg-day
A:	1	
EF:	350	days/year
Conversion Factor:	365	days/year
Conversion Factor:	0.000001	mg*m^3/ug*L
Dose-air:	2.78E-04	mg/kg-day
CPF:	0.1	kg-d/mg
ASF:	1	
ED:	54	years
AT:	70	years
FAH:	1	
Risk-air:	2.15E-05	

E. Source Comparison

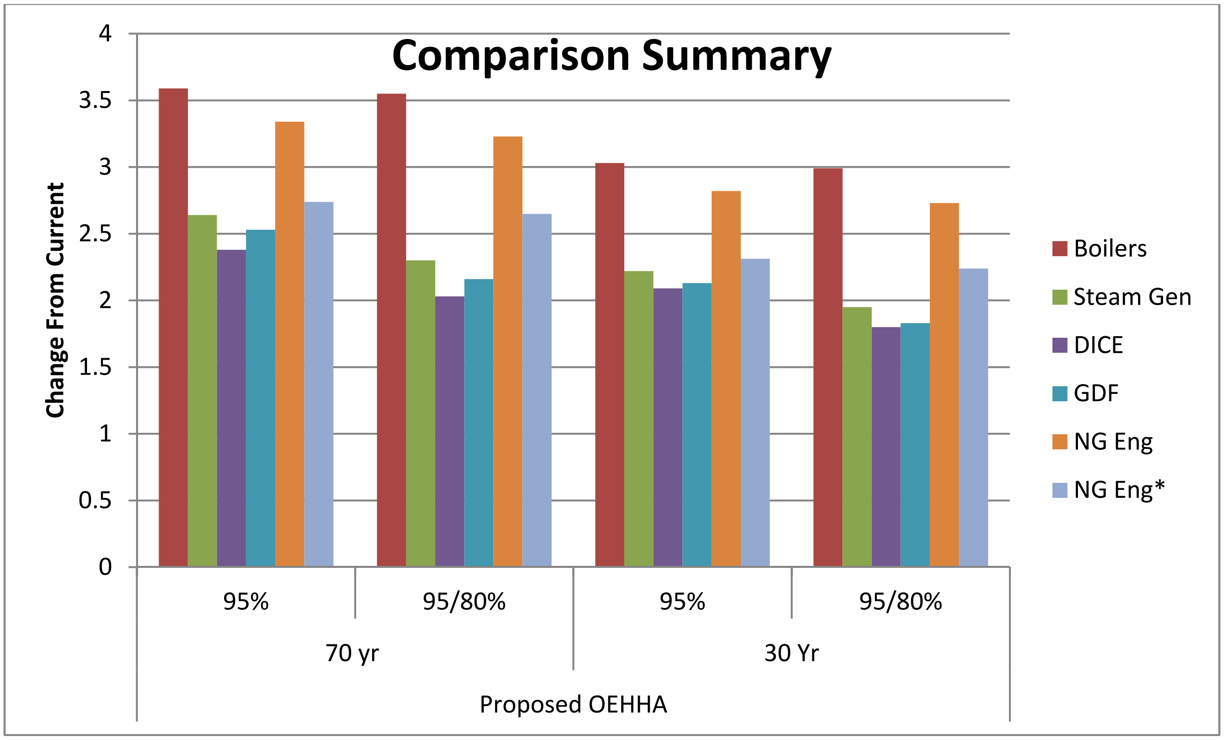
For the source comparisons, each source type (diesel fired internal combustion engines, natural gas fired internal combustion engine, etc.) was evaluated separately. Within each source type, at various levels of usage or capacities, the calculated risk is compared between the current method and the proposed OEHHA method. The exposure time of 70 years and 30 years are compared, and the 80th percentile and 95th percentile breathing rates are compared.

The magnitude of change for each source type is calculated by dividing each scenario's maximum risk by the current method, which uses an exposure time of 70 years and a 95th percentile breathing rate. For example, 2.38 means the proposed scenario would result in a calculated risk increase of 2.38 times that of the current method.

Based on the modeling conducted for steam generators, diesel internal combustion engines, gasoline dispensing operations, and natural gas internal combustion engines the expected change in risk from current estimates range from 2.38 to 3.59 times higher than the current method. The table and the chart below summarize the results from all the source types modeled and the ranges of expected increases in calculated risk from the current method. In addition, a determination for the upper and lower 5% of the range was determined to be between 2.41 and 3.54 times higher from previous estimates.

Summary of Source Comparison						
Source Types	Current Method		Proposed OEHHA			
	70yr.		70yr.		30yr.	
	95%	80%	95%	95/80%	95%	95/80%
Boilers	1	0.77	3.59	3.55	3.03	2.99
Steam Gen	1	0.77	2.64	2.30	2.22	1.95
DICE	1	0.77	2.38	2.03	2.09	1.8
GDF	1	0.77	2.53	2.16	2.13	1.83
NG Engine	1	0.77	3.34	3.23	2.82	2.73
NG Engine*	1	0.77	2.74	2.65	2.31	2.24

*PAH - Mother Milk not included (18% reduction)



*PAH - Mother Milk not included (18% reduction)

VII. ISSUES UNDER CONSIDERATION

Currently, the District utilizes the following cancer risk action thresholds with respect to implementing the District's AB2588 Air Toxics Hot Spots program:

- 10 in a million cancer risk cumulative for the facility triggers notification of impacted neighbors and public meetings to explain risk
- 100 in a million cancer risk cumulative for the facility triggers a risk reduction audit and plan

The District Governing Board directed staff to maintain these notification and risk reduction thresholds for the purposes of implementing AB2588. Therefore, the District is not requesting comments on this issue.

In addition, the District utilizes the following action thresholds with respect to permitting and CEQA:

- 1 in a million cancer risk for each permit unit – Requires installation of Toxic Best Available Control Technology (TBACT)
- 10 in a million cancer risk cumulative for the facility since 1995 – Deny permit for the project
- 10 in a million cancer risk for project – Project deemed significant for CEQA purposes

The Governing Board provided direction to staff to consider adjustments to permitting and CEQA action thresholds to avoid unreasonable restrictions while preventing any relaxation of current health protections provided by the District's current risk management practices.

The increase in calculated risk caused by OEHHA's proposed changes, if implemented without careful consideration of the implications and consequences, has the potential to significantly delay or even prevent the permitting of many common types of operations, such as gas stations, emergency engines, and automotive body shops, while simultaneously causing significant confusion about health risk impacts amongst concerned residents of the San Joaquin Valley. In addition to the potential impact on economic growth in the San Joaquin Valley, it's important to note that many of these units, such as emergency engines, are necessary components of operations essential for human health and safety, like hospitals, jails, and communication systems.

With respect to permitting and CEQA action thresholds, the District is seeking comment on the following issues:

1. **Residential Exposure Period**. As discussed above, staff analyzed residential exposure periods of 30 years versus 70 years. The District currently uses an exposure period of 70 years. OEHHA recommends an exposure period of 30 years. Implementing this OEHHA recommendation would tend to reduce calculated risk compared to the District's current methodologies.

2. **Worker Exposure Period**. The District currently uses an exposure period of 40 years. OEHHA recommends an exposure period of 25 years. Implementing this OEHHA recommendation would tend to reduce calculated risk compared to the District's current methodologies.

3. **Age Groups (Bin).** The District currently uses a single age group (0-70 years), based on OEHHA's current methodology, to calculate risk. OEHHA is now recommending that risk assessments be calculated for the third trimester to age zero, ages zero to less than two, ages two to less than nine, ages two to less than 16, ages 16 to less than 30, and ages 16 to 70 age groups (bins). Implementing this OEHHA recommendation would tend to increase calculated risk compared to the District's current methodologies.

4. **Age Sensitivity Factors**. The District's current methodology, based on OEHHA's current methodology, does not provide age specific adjustments. OEHHA's proposed methodology provides a 10-fold multiplier in exposure to infants (3rd Trimester to age 2) and a 3-fold increase in exposure for children (ages 2 to 16 years old). Ages 16 and older have an exposure factor of 1.

Implementing this OEHHA recommendation would tend to increase calculated risk compared to the District's current methodologies.

5. **Breathing Rates.** Based on OEHHA's current methodology, the District currently uses a conservative 95th percentile breathing rate for adults, workers and children. OEHHA's proposed methodology provides a different breathing rate for each of the proposed age groups (the third trimester to age zero, ages zero to less than two, ages two to less than nine, ages two to less than 16, ages 16 to less than 30, and ages 16 to 70). OEHHA proposes the use of the 95th percentile for all age groups up to 16 years old, but allows the use of the 80th percentile for all older individuals. Implementing this OEHHA recommendation would tend to increase calculated risk for children compared to the District's current methodologies, but result in a reduction in calculated risk for adults.

6. **Permitting and CEQA Risk Thresholds.** As shown in the above analysis, using the revised methodology with the most health-protective exposure period of 70 years and the 95th percentile breathing rate (for all age groups) will increase the calculated risk between 2.38 and 3.59 times the current District method. In other words, the 10 in a million risk threshold using the current methodology would be equivalent to a 23.8 to 35.9 in a million risk threshold under the new OEHHA methodology. Using the less conservative and less health protective components allowed by the proposed OEHHA changes (30 year exposures and 80th percentile breathing rate) only increases the calculated risk 1.8 to 3.0 times the current District method.

   Note that these numbers do not represent an increase in actual risk, but is a calculated change due to revised calculation methodologies. However, if the District does not update the permitting thresholds from the existing 10 in a million cancer risk, the proposed OEHHA changes will result in denial of permits for a variety of equipment that currently may be permitted. For instance, emergency generators at hospitals are commonly modelled to create up to 10 in a million cancer risk. Any such generator would be calculated to have a risk of about 18 to 24 in a million under the revised OEHHA guidelines, and would not be issued a permit under the District's current risk assessment policies.

   The District is requesting comments on where the permitting and CEQA thresholds should be placed. All comments submitted remain consistent with the Governing Board's directive to prevent unreasonable restrictions on permitting of stationary sources and California Environmental Quality Act (CEQA) projects while preventing any relaxations of current health protections.

Written comments should be addressed to Mr. Chay Thao at SJVUAPCD, 1990 East Gettysburg Ave., Fresno, CA 93726 and must be received by 5:00 pm Pacific Time on November 8, 2014.

A public workshop will be held to present, discuss, and receive comments on these issues. It will be presented in-person in Fresno, via Video Teleconferencing (VTC), and Webcast at the following time and locations:

October 9, 2014 (Thursday)
1:30 PM
In-person: Fresno
VTC: Bakersfield & Modesto Offices
Webcast link available at http://www.valleyair.org/Workshops/public_workshops_idx.htm

Fresno: Governing Room, SJVUAPCD Office, 1990 E. Gettysburg Avenue
Bakersfield: VTC Room, SJVUAPCD Office, 34946 Flyover Court
Modesto: VTC Room, SJVUAPCD Office, 4800 Enterprise Way

VIII. ENVIRONMENTAL IMPACT ANALYSIS

Pursuant to §15061 of the Guidelines for Implementation of the California Environmental Quality Act (CEQA), District staff investigated the possible environmental impacts of the proposal. Any proposal consistent with the Governing Board's direction (i.e., no changes in District policy should allow relaxation in current health protections) would inherently result in no adverse environmental impact compared to the status quo.

Based on the lack of evidence to the contrary, District staff has concluded that the proposal will not have any significant adverse effects on the environment. Staff recommends filing a Notice of Exemption under the provisions of Public Resource Code 15061(b)(3).

Appendix A – Modeling Parameters

District Screening Tool Modeling Documentation
Date Prepared: August 1, 2014

Dispersion Model: AERMOD V14134

1. Control Pathway
   1.1. Output type: Concentration
   1.2. Non-Default options: Flat
   1.3. Pollutant type: Other (Toxics)
   1.4. Averaging time options: 1h, 2h, 3h, 4h, 6h, 8h, 12h, 24h, month and period
   1.5. Dispersion coefficients: rural, or urban with a population of 461,116

2. Source Pathway
   2.1. All emissions units centered on coordinate (0,0)
   2.2. Combustion point sources inputs
      2.2.1. Emission rate: 1 g/s

Source ID	Rating	Rating Units	Release Height (m)	Stack Inside Diameter (m)	Gas Exit Temp. (K)	Gas Exit Velocity (m/s)
Diesel Reciprocating Internal Combustion Engines						
50_DE	0 - 50	BHP	2.97	0.07	799.80	52.65
100_DE	50 - 100	BHP	2.92	0.09	756.18	62.93
150_DE	100 - 150	BHP	2.69	0.10	759.49	58.78
175_DE	150 - 175	BHP	2.50	0.10	768.31	63.22
200_DE	175 - 200	BHP	3.04	0.12	765.80	54.28
275_DE	200 - 275	BHP	2.43	0.12	795.31	50.25
300_DE	275 - 300	BHP	3.55	0.13	728.55	54.78
400_DE	300 - 400	BHP	2.42	0.13	754.96	81.71
500_DE	400 - 500	BHP	2.85	0.18	761.90	71.23
550_DE	500 - 550	BHP	3.12	0.15	768.27	91.27
600_DE	550 - 600	BHP	3.71	0.16	793.56	92.45
750_DE	600 - 750	BHP	3.84	0.17	798.16	160.56
825_DE	750 - 825	BHP	6.07	0.19	784.00	87.68
1150_DE	825 - 1150	BHP	3.85	0.24	779.86	71.16
1500_DE	1150 - 1500	BHP	7.26	0.31	758.00	40.51
1850_DE	1500 - 1850	BHP	3.73	0.21	741.24	133.59
2500_DE	1850 - 2500	BHP	6.33	0.45	727.14	40.24

Natural Gas Reciprocating Internal Combustion Engines						
50_NE	0 - 75	BHP	4.39	0.07	847.87	39.43
75_NE	75 - 100	BHP	3.78	0.08	846.44	66.81
100_NE	100 - 125	BHP	3.22	0.09	761.66	78.25
125_NE	125 – 150	BHP	2.60	0.10	878.51	54.14
150_NE	150 - 175	BHP	3.13	0.14	883.93	53.01
175_NE	175 - 200	BHP	2.80	0.09	866.23	85.26
200_NE	200 – 250	BHP	2.86	0.12	939.36	64.30
250_NE	250 - 500	BHP	5.11	0.19	819.49	59.27
500_NE	500 - 750	BHP	6.50	0.21	770.34	49.81
750_NE	750 - 1000	BHP	5.99	0.24	804.79	60.36
1000_NE	1000 - 1500	BHP	6.78	0.35	745.19	63.90
1500_NE	1500 - 4000	BHP	7.92	0.49	731.79	28.74
Natural Gas Simple Cycle Turbines						
5_TUR	0 - 50	MMBtu/hr	12.60	1.08	425.66	23.24
25_TUR	50 - 300	MMBtu/hr	13.54	3.86	705.68	19.39
50_TUR	300 - 500	MMBtu/hr	27.62	3.48	655.13	32.88
100_TUR	500 - 1000	MMBtu/hr	33.53	4.47	706.88	38.32
Natural Gas Combined Cycle Turbines						
5_COG	0 - 50	MMBtu/hr	10.93	1.19	475.93	20.08
25_COG	50 - 250	MMBtu/hr	18.46	2.27	409.55	22.24
50_COG	250 - 475	MMBtu/hr	21.83	3.21	411.10	20.88
100_COG	475 - 1000	MMBtu/hr	30.88	5.09	427.15	21.24
250_COG	1000 - 1800	MMBtu/hr	38.81	5.26	368.61	21.51
Gaseous Fuel Fired (Natural Gas) Boilers						
5_BLR	0 - 5	MMBtu/hr	9.00	0.41	438.25	5.03
10_BLR	5 - 10	MMBtu/hr	8.40	0.50	464.60	6.87
15_BLR	10 - 15	MMBtu/hr	8.30	0.55	470.83	8.66
20_BLR	15 - 20	MMBtu/hr	10.60	0.69	467.68	6.77
30_BLR	20 - 30	MMBtu/hr	10.00	0.67	468.50	10.65
40_BLR	30 - 40	MMBtu/hr	9.70	0.72	495.39	12.56
50_BLR	40 - 50	MMBtu/hr	11.40	0.88	442.11	8.98
75_BLR	50 - 75	MMBtu/hr	13.40	1.09	440.84	10.41
100_BLR	75 - 100	MMBtu/hr	11.30	1.11	448.30	10.21
150_BLR	100 - 150	MMBtu/hr	11.30	1.41	418.55	6.78
200_BLR	150 - 200	MMBtu/hr	16.30	1.51	430.63	12.31
Gaseous Fuel Fired Oil Production Steam Generator						

58_STM	58.5	MMBtu/hr	9.02	0.98	449.82	9.38
62_STM	62.5	MMBtu/hr	6.90	0.92	399.74	9.47
85_STM	85.5	MMBtu/hr	5.65	1.02	389.85	13.54

2.3. Gasoline dispensing operations inputs

2.3.1. Vehicle spillage

- Source ID: SPILL
- Source type: Volume
- Emission rate: 1 g/s
- Release height: 0 m
- Length of side: 6.5 m
- Initial lateral dimension: 1.51 m
- Initial vertical dimension: 1.86 m

2.3.2. Vehicle refueling and hose permeation

- Source ID: REFUEL
- Source type: Volume
- Emission rate: 1 g/s
- Release height: 1 m
- Length of side: 6.5 m
- Initial lateral dimension: 1.51 m
- Initial vertical dimension: 1.86 m

2.3.3. Breathing loss

- Source ID: BREATHE
- Release type: Vertical
- Source type: Point
- Emission rate: 1 g/s
- Release height: 3.66 m
- Gas exit temperature: 288.71 K
- Stack inside diameter: 0.0508 m
- Gas exit velocity: 0.000106 m/s
- Gas exit flow rate: 0.0005 cfm

2.3.4. Loading loss

- Source ID: LOAD
- Release type: Vertical
- Source type: Point
- Emission rate: 1 g/s

- Release height: 3.66 m
- Gas exit temperature: 291 K
- Stack inside diameter: 0.0508 m
- Gas exit velocity: 0.00035 m/s
- Gas exit flow rate: 0.0015 cfm

2.3.5. Thermal oxidizer (Hirt burner)

- Source ID: HIRT
- Release type: Vertical
- Source type: Point
- Emission rate: 1 g/s
- Release height: 2.185 m
- Gas exit temperature: 700 K
- Stack inside diameter: 0.15 m
- Gas exit velocity: 1.77 m/s
- Gas exit flow rate: 66.275 cfm

2.4. Painting operation inputs

2.4.1. Outside painting (no booth)

- Source ID: PNT_OUTSIDE
- Source type: Volume
- Emission rate: 1 g/s
- Release height: 0 m
- Length of side: 9.15 m
- Initial lateral dimension: 2.13 m
- Initial vertical dimension: 1.7 m

2.4.2. Painting inside a building without an exhaust fan/stack

- Source ID: PNT_DOOR
- Assume release is through a roll up door 2.44 m wide, 3.048 m tall, and 4 m from the nearest building edge
- Source type: Volume
- Emission rate: 1 g/s
- Release height: 1.52 m
- Length of side: 3.124 m
- Initial lateral dimension: 0.73 m
- Initial vertical dimension: 1.42 m

2.4.3. Paint booth vented through an exhaust stack without a fixed rain cap

- Source ID: PNT_STK

- Release type: Vertical
- Source type: Point
- Emission rate: 1 g/s
- Release height: 7.16 m
- Gas exit temperature: 293 K
- Stack inside diameter: 0.48 m
- Gas exit velocity: 38.71 m/s
- Gas exit flow rate: 14,842.34 cfm

2.4.4. Paint booth vented through an exhaust stack with a fixed rain cap

- Source ID: PNT_CAP
- Source type: Area
- Emission rate: 0.028 g/s-m^2
- Release height: 6 m
- Length of x side: 6 m
- Length of y side: 6 m
- Orientation angle from North: 0 deg

2.5. Commercial cooking operation inputs

2.5.1. Commercial cooking vented through an exhaust stack without a fixed rain cap

- Source ID: COOK_STK
- Source type: Point
- Release type: vertical stack
- Emission rate: 1 g/s
- Release height: 6.096 m
- Gas exit temperature: 366.483 K
- Stack inside diameter: 0.3048 m
- Gas exit velocity: 6.147 m/s
- Gas exit flow rate: 950.3636 cfm

2.5.2. Commercial cooking vented through an exhaust stack with a fixed rain cap

- Source ID: COOK_CAP
- Source type: Point
- Release type: Vertical capped stack
- Emission rate: 1 g/s
- Release height: 6.096 m
- Gas exit temperature: 366.483 K
- Stack inside diameter: 0.3048 m

- Gas exit velocity: 6.147 m/s (0.001 m/s if the capped stack subroutine is not used)
- Gas exit flow rate: 950.3636 cfm

2.6. Truck idling and transportation refrigeration unit (TRU) inputs

2.6.1. Truck idling with a vertical release

- Source ID: IDLE_V
- Source type: Point
- Release type: vertical stack
- Emission rate: 1 g/s
- Release height: 3.84 m
- Gas exit temperature: 366 K
- Stack inside diameter: 0.1 m
- Gas exit velocity: 51.71 m/s
- Gas exit flow rate: 860.5 cfm

2.6.2. Truck idling with a horizontal low level release

- Source ID: IDLE_HL
- Source type: Point
- Release type: horizontal stack
- Emission rate: 1 g/s
- Release height: 0.183 m
- Gas exit temperature: 366 K
- Stack inside diameter: 0.1 m
- Gas exit velocity: 51.71 m/s
- Gas exit flow rate: 860.5 cfm

2.6.3. Truck idling with a horizontal high level release

- Source ID: IDLE_HH
- Source type: Point
- Release type: horizontal stack
- Emission rate: 1 g/s
- Release height: 3.84 m
- Gas exit temperature: 366 K
- Stack inside diameter: 0.1 m
- Gas exit velocity: 51.71 m/s
- Gas exit flow rate: 860.5 cfm

2.6.4. Transportation refrigeration unit

- Source ID: TRU

- Source type: Point
- Release type: vertical stack
- Emission rate: 1 g/s
- Release height: 3.962 m
- Gas exit temperature: 501 K
- Stack inside diameter: 0.044 m
- Gas exit velocity: 49 m/s
- Gas exit flow rate: 157.87 cfm

2.7. Road travel inputs

- Source type: Line volume
- Configuration: Adjacent
- Release type: Surface-based
- Plume height: 1.829 m
- Plume width: 3.66 m
- Emission rate: 1 g/s
- Release height: 1.83 m

Segment Length (m)	**Source ID**	**Node 1**		**Node 2**	
		X Coord. (m)	**Y Coord. (m)**	**X Coord. (m)**	**Y Coord. (m)**
402	QTR_NS	0	201	0	-201
402	QTR_EW	201	0	-201	0
402	QTR_NWSE	-142.1	142.1	142.1	-142.1
402	QTR_NESW	142.1	142.1	-142.1	-142.1
50	50_NS	0	25	0	-25
50	50_EW	25	0	-25	0
50	50_NWSE	-17.7	17.7	17.7	-17.7
50	50_NESW	17.7	17.7	-17.7	-17.7

3. Receptor Pathway

3.1. Combustion point sources, gasoline dispensing stations, painting operations and commercial cooking operations

- Uniform polar grid
- Center coordinates: (0,0)
- Number of direction radials: 36
- Direction increment (Theta): 10

- Number of rings: 38
- Distance from origin to rings (m): 25, 50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1150, 1300, 1450, 1600, 1750, 1900, 2050, 2250, 2450, 2650, 2850, 3050, 3250, 3450, 3650, 3850, 4050, 4250, 4450, 4650, 4850
- Number of receptors: 1,368

3.2. Roads

3.2.1. Discrete receptors were created from two uniform polar grids, which were converted to discrete receptors.

3.2.2. Receptors within the volume source exclusion zones and along the path of the road were deleted.

3.2.2.1. Grid 1

- Center coordinates: (0,0)
- Number of direction radials: 72
- Direction increment (Theta): 5
- Number of rings: 5
- Distance from origin to rings (m): 10, 25, 50, 75, 100

3.2.2.2. Grid 2

- Center coordinates: (0,0)
- Number of direction radials: 36
- Direction increment (Theta): 10
- Number of rings: 34
- Distance from origin to rings (m): 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1150, 1300, 1450, 1600, 1750, 1900, 2050, 2250, 2450, 2650, 2850, 3050, 3250, 3450, 3650, 3850, 4050, 4250, 4450, 4650, 4850

4. Building inputs (for building downwash)

4.1. Combustion point sources, painting operations and commercial cooking operations

- Height: 6 m
- X-length: 12 m
- Y-length: 12 m

4.2. Gasoline dispensing operations

- Height: 4 m
- X-length: 6.5 m
- Y-length: 6.5 m

4.3. Truck idling & transportation refrigeration units

- Height: 3.962 m
- X-length: 9.144 m
- Y-length: 9.144 m

Appendix B - Meteorological Data

District Screening Tool Modeling Documentation
Date Prepared: August 1, 2014

AERMOD Meteorological Preprocessor: AERMET v14134

AERMET options used in the processing of the met data used include:

1. 1-Minute ASOS Wind Data (where available).
2. 1-Minute ASOS Threshold Wind Speed of 0.5 m/s.
3. No other options used, including EPA Beta Options.

Dispersion modeling was conducted for the following sites:

District	Location	Station ID	Elevation (m)	No. of Years	Years
SJVAPCD	Arvin	MM5	267	5	2007-2011
SJVAPCD	Bakersfield	23155	149	5	2008-2012
SJVAPCD	Fellows	MM5	472	5	2004-2008
SJVAPCD	Fresno	93193	101.5	5	2008-2012
SJVAPCD	Hanford	53119	74	5	2008-2012
SJVAPCD	Kettleman	MM5	174	5	2007-2011
SJVAPCD	Lemoore NAS	23110	72	3	2007-2009
SJVAPCD	Los Banos	MM5	42	5	2004-2008
SJVAPCD	Madera	93242	75	3	2009-2011
SJVAPCD	Mendota	MM5	45	5	2007-2011
SJVAPCD	Merced	23257	46	5	2008-2012
SJVAPCD	Missouri Triangle	MM5	268	5	2004-2008
SJVAPCD	Modesto	23258	22	5	2008-2012
SJVAPCD	Porterville	23149	135	2	2011-2012
SJVAPCD	Stockton	23237	8	5	2008-2012
SJVAPCD	Tipton	MM5	64	5	2007-2011
SJVAPCD	Tracy	MM5	158	5	2004-2008
SJVAPCD	Turk	MM5	165	5	2004-2008
SJVAPCD	Visalia	93144	90	4	2007-2010
SJVAPCD	Wasco	MM5	77	5	2007-2011