APPENDIX E:
HEALTH RISK ASSESSMENT

Health Risk Assessment | January 2016

The Hamptons Redevelopment Project

for the City of Cupertino

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1. Introduction

The Irvine Company is proposing to demolish the existing 342 multi-family residential units and redevelop the project site with 942 multi-family units in a six building residential apartment community. The buildings would range in height from six to seven stories. The site is located at 19500 Pruneridge Avenue in Cupertino, Santa Clara County, California. This report presents the results of a construction and operational health risk assessment for the proposed project.

The latest version of the Bay Area Air Quality Management District (BAAQMD) CEQA Air Quality Guidelines requires projects to evaluate the impacts of construction activities on sensitive receptors (BAAQMD, 2012). Project construction is anticipated to take place starting in middle of July 2017 and be completed by the end of September 2020, approximately 1,174 calendar days (838 workdays).

The nearest off-site sensitive receptors are the multi-family residences at the Arioso Apartment complex approximately 410 feet west of the project site. The BAAQMD has developed *Screening Tables for Air Toxics Evaluation During Construction* (2010) that evaluate construction-related health risks associated with residential, commercial, and industrial projects. According to the screening tables, the residences are closer than the distance of 137 meters (450 feet) that would screen out potential health risks and could be potentially impacted from the proposed construction activities. Therefore, a site-specific construction health risk assessment (HRA) was prepared for the proposed project.

In addition to project construction, operation of the proposed project would place sensitive receptors in proximity to nearby sources of toxic air contaminants (TACs) and fine particulate matter ($PM_{2.5}$) emissions. Guidance from the California Environmental Protection Agency (Cal/EPA), Office of Environmental Health Hazard Assessment (OEHHA), California Air Pollution Control Officers Association (CAPCOA), and the Bay Area Air Quality Management District (BAAQMD) recommend the completion of health risk assessments to determine the impacts of hazardous air emissions upon land use projects that place receptors in the vicinity of existing sources. Evaluated emission sources include vehicles and trucks traveling on the Interstate 280 (I-280) freeway, which is 360 feet southwest of the proposed site. In addition to I-280, other high volume roadways with annual average daily traffic volumes exceeding 10,000 vehicles per day were evaluated. Identified high volume roadways within 1,000 feet of the project include Wolfe Road and Pruneridge Avenue. Lastly, stationary sources located at the future Apple Campus 2 to the east were included in the evaluation.

This HRA considers the health impact to off-site sensitive receptors (adults and children in the nearby residences) of construction emissions at the project site from diesel equipment exhaust (diesel particulate matter or DPM) and $PM_{2.5}$. Additionally, the HRA also evaluates the health impacts to on-site receptors from the vehicular emissions along I-280, high volume roadways, and stationary sources proximate to the project site.

1. Introduction

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2. Project Description

The 12.4 acre project site is currently situated with 342 existing multi-family units housed within 10 separate buildings. The site is bound by Pruneridge Avenue to the north, the Apple Campus 2 site to the east, the I-280 exit ramp to the south, and Wolfe Road to the west. Surrounding sensitive land uses include the Arioso Apartments and other multi-family residences to the west as well as single-family housing further to the west.

The proposed project would demolish and remove the existing residential development and would redevelop the site with 942 new multi-family residential units. The units will be contained within six buildings ranging from six- to seven-stories. The buildings within 50 feet of Wolfe Road, Pruneridge Avenue, and the Apple Campus 2 will maintain a maximum building of 60 feet. I-280 is approximately 360 feet southwest of the project site.

The project site and vicinity are depicted in Figure 1.

2. Project Description

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Figure 1 - Project and Off-Site Receptor Locations

Source: Google Earth Pro, 2015

2. Project Description

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3. Methodology and Significance Thresholds

The purpose of the HRA is to evaluate the potential health impacts from DPM and $PM_{2.5}$ emitted during construction activities, as well as DPM, Total Organic Gases (TOG), and $PM_{2.5}$ emitted from nearby mobile and stationary sources during occupancy of the units (operational phase). Construction sources evaluated in this HRA include off-road construction equipment, such as excavators, tractors/loaders/backhoes, cranes, forklifts, generators, welders, and air compressors. Operational sources include vehicular emissions from cars and trucks traveling along I-280, Wolfe Road, and Pruneridge Avenue, and stationary sources operating at the proposed Apple Campus 2.

In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of the CEQA Guidelines. In May 2011, the updated BAAQMD CEQA Air Quality Guidelines were amended to include a risk and hazards threshold for new receptors and modified procedures for assessing impacts related to risk and hazard impacts. Due to litigation, BAAQMD is no longer recommending that these thresholds be used as a generally applicable measure of a project's significant air quality impacts, but leaves it up to the discretion of the local enforcement agency (LEA) to determine whether these thresholds are appropriate for their use. For this HRA, the BAAQMD significance thresholds were deemed to be appropriate and the thresholds that were used for this project are shown below:

- Non-compliance with a qualified risk reduction plan
- Excess cancer risk of more than 10 in a million
- Non-cancer hazard index (chronic or acute) greater than 1.0
- Incremental increase in average annual $PM_{2.5}$ concentration of greater than 0.3 $\mu g/m^3$

In addition, there are thresholds of significance for cumulative impacts defined as the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius of a source or receptor, plus the contribution from the project, exceeds the following:

- Non-compliance with a qualified risk reduction plan
- Excess cancer risk of more than 100 in a million
- Non-cancer hazard index (chronic or acute) greater than 10
- Average annual $PM_{2.5}$ concentration of greater than 0.8 $\mu g/m^3$

Since both the City of Cupertino and Santa Clara County do not currently have qualified risk reduction plans, a site-specific analysis of DPM, TOGs, and $PM_{2.5}$ impacts on sensitive receptors was conducted.

The methodology used in this HRA is consistent with the following BAAQMD and the Office of Environmental Health Hazard Assessment (OEHHA) guidance documents:

3. Methodology and Significance Thresholds

- BAAQMD, 2012. *California Environmental Quality Act Air Quality Guidelines*. May 2012.
- BAAQMD, 2010. *Screening Tables for Air Toxics Evaluation During Construction.* May 2010.
- BAAQMD, 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. Version 3.0. May 2012.
- OEHHA. 2015. *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments.* February, 2015.

Potential exposures to DPM and $PM_{2.5}$ from proposed project construction were evaluated for off-site sensitive receptors in close proximity to the site, which includes the multi-family residences west of the project site. Potential exposures to DPM, TOGs, and $PM_{2.5}$ from operational activities were evaluated for on-site sensitive receptors of the project. Using air dispersion models, receptor concentrations were estimated and excess lifetime cancer risks and chronic and acute non-cancer hazard indexes were calculated. These risks were then compared to the significance thresholds adopted for this HRA.

4. Emissions Inventories

4.1 CONSTRUCTION EMISSIONS

Construction emissions were calculated as average daily emissions in pounds per day, using the proposed construction schedule and the latest version of California Emissions Estimation Model, known as CalEEMod Version 2013.2.2 (CAPCOA, 2013). DPM emissions were based on the CalEEMod construction runs, using annual exhaust PM_{10} construction emissions presented in lbs/day. The $PM_{2.5}$ emissions were taken from the CalEEMod output for $PM_{2.5}$ total, which includes exhaust $PM_{2.5}$ as well as fugitive dust $PM_{2.5}$.

The project was assumed to take place over 38.5 months (1,174 calendar days or 838 work days) from the middle of July 2017 through the end of September 2020. The average daily emission rates from construction equipment used during the proposed project were determined by dividing the annual average emissions for each construction year by the number of construction days per year for each calendar year of construction (i.e., 2017. 2018, 2019, and 2020). The modeled average daily emission rates for the construction scenario are summarized in Table 1. The CalEEMod construction emissions output and emission rate calculations are provided in Appendix A.

Table 1 Construction Activity – Average Daily Emission Rates

Parameter – Year	Onsite Emissions (lbs/day)	Total Offsite Emissions (lbs/day)
DPM – 2017	3.81	0.67
$PM_{2.5}$ - 2017	4.58	2.08
DPM – 2018	1.94	0.45
$PM_{2.5}$ - 2018	1.82	4.05
DPM – 2019	1.22	0.29
$PM_{2.5}$ - 2019	1.15	2.76
DPM – 2020	1.15	0.27
$PM_{2.5}$ - 2020	1.09	2.79

Presented emission rates are average daily emissions.
Source: CalEEMod 2013.2.2.

4.2 OFF-SITE EMISSION SOURCES

Mobile sources within a 1,000-foot radius of the project site were identified using BAAQMD's Highway Screening Analysis Tools (BAAQMD, 2011) and the Draft Transportation Impact Analysis (TIA) prepared for the project (Fehr and Peers, 2015). One highway (I-280) and two high volume roadways, which are defined as having annual average daily trips (AADT) exceeding 10,000 vehicles per day, were identified (Wolfe Road and Pruneridge Avenue). The screening health risk values for each mobile source considered in the assessment are summarized in Table 2.

Table 2 Mobile Source Screening Health Risk Values

Source	Annual Average Daily Trips (AADT)	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
Interstate 280 [1]	162,000	29.2	0.030	0.026	0.25
Wolfe Road [2]	55,988	30.9	0.030	0.030	0.73
Pruneridge Avenue [2]	12,624	6.16	0.030	0.030	0.16
BAAQMD Significance Threshold		10	1.0	1.0	0.3
Exceeds Threshold?		Yes	No	No	Yes

Sources:
1 Highway traffic from CalTrans (2015) and highway risk values from BAAQMD Highway Screening Analysis Tool (2011).
2 Surface street traffic from Draft TIA for the Hamptons Apartment Complex (Fehr and Peers, 2015), and roadway risk values determined using the BAAQMD Roadway Screening Analysis Calculator (2015).

The screening health risk values for Pruneridge Avenue are below the BAAQMD significance thresholds for individual health risks (10 in a million excess cancer risk or $PM_{2.5}$ concentration greater than 0.3 $\mu g/m^3$), and therefore a more detailed analysis was not required. However, because I-280 and Wolfe Road exceed the threshold for cancer risk, and Wolfe Road exceeds the threshold for $PM_{2.5}$, refined air dispersion modeling was conducted for these mobile sources. Emissions generated from mobile sources depend on the vehicle mix, the rate at which pollutants are generated during the course of travel, and the number of trucks traveling along the roadway network.

To produce a representative vehicle fleet distribution of gasoline fueled and diesel fueled vehicles, the assessment used an estimate of vehicle mix based on annual traffic and truck traffic reports from the California Department of Transportation, Traffic Branch (Caltrans) for I-280 and traffic volumes from the Draft TIA for the project (Fehr and Peers, 2015) for Wolfe Road. Table 3 lists the identified peak hourly traffic volumes and diesel truck percentage considered in the assessment.

Table 3 Vehicle Fleet Mix Profile

Roadway	Peak Hourly Vehicle Traffic (Veh/hr)	Truck Percentage
I-280 (Mile Post 8.375) [1]	12,500	3.16
Wolfe Road (south of Pruneridge Avenue) [2]	5,036	3.51

Sources:
1 Caltrans Traffic Census Website. http://traffic-counts.dot.ca.gov/.
2 Draft TIA for Hamptons Apartment Complex (Fehr and Peers, 2015).

The truck percentage for each evaluated roadway segment was used to estimate the number of diesel trucks traveling on each roadway. To determine hourly traffic volumes, the assessment used data available through the Caltrans Performance Measurement System (Caltrans PeMS, 2015). To account for the emission standards representative of the California fleet, the Air Resources Board has developed the EMFAC2014 emission factor model. EMFAC2014 was used to identify pollutant emission rates for total organic gases (TOG) and diesel particulate matter (DPM), as well as projected traffic increases. To quantify the toxic air contaminants (TACs) associated with the TOG fraction, the speciation profile provided by BAAQMD (2011) was used. Vehicles were assumed to be traveling at 55 mph along Interstate 280 and 35 mph along Wolfe Road.

In addition to mobile sources, stationary sources within a 1,000-foot radius of the project site were identified using BAAQMD's Stationary Source Screening Analysis Tools (BAAQMD, 2012). Only one inactive stationary source was identified, which was associated with the former Apple facility to the east. However, the future Apple Campus 2 will include natural gas boilers, emergency diesel generators, and other equipment that produce TAC emissions. An HRA was prepared for the Apple Campus 2 by LSA Associates, Inc. (2013), which determined the risks to off-site residents from operations at the Apple Campus 2. The health risk values associated with the Apple Campus 2 are summarized in Table 4, and are below the significance thresholds.

Table 4 Stationary Source Health Risk Values

Source	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
Apple Campus 2	1.15	0.302	n/a	0.171
BAAQMD Significance Threshold	10	1.0	1.0	0.3
Exceeds Threshold?	No	No	No	No

Sources: Apple Campus 2 Project EIR, L. Air Quality (LSA Associates, Inc., 2015).

For the sources that warranted additional characterization (I-280 and Wolfe Road), contaminant release information and associated chemical species were identified based on the speciation profiles provided by BAAQMD. A list of emitted compounds for the mobile-source category is presented in Table 5. Appendix A contains a graphical representation of each emitting source and emission rate calculations for each source considered in the assessment.

4. Emissions Inventories

Table 5 Compounds Emitted from Mobile Sources

Source	Contaminant
I-280 and Wolfe Road	Acetaldehyde Acrolein Benzene 1,3-Butadiene Ethylbenzene Formaldehyde Hexane Methanol Methyl Ethyl Ketone Naphthalene Propylene Styrene Toluene Xylenes Diesel Particulate Exhaust Fine Particulate Matter ($PM_{2.5}$)

The emission source proximate to the project site are depicted in Figure 2.

Figure 2 - Off-Site Emission Sources

Project Boundary
1,000-Ft Radius

1 Interstate 280
2 Wolfe Road
3 Pruneridge Avenue
4 Apple Campus 2

0 500
Scale (Feet)

Source: Google Earth Pro, 2015

4. Emissions Inventories

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5. Dispersion Modeling

To assess the impact of emitted compounds on sensitive receptors near the project, air quality modeling using the ISCST3 atmospheric dispersion model was performed. The model is a steady state Gaussian plume model and is an approved model by BAAQMD for estimating ground level impacts from point and fugitive sources in simple and complex terrain. The on-site construction emissions for the project were modeled as poly-area sources. The off-site mobile sources were modeled as adjacent line volume sources.

The model requires additional input parameters, including chemical emission data and local meteorology. Inputs for the construction and operational phase emission rates are those described in Section 4. Meteorological data obtained from the BAAQMD for the nearest representative met station with the three latest available years of record (Alviso, 1998-2000) were used to represent local weather conditions and prevailing winds. The general prevailing winds at the project are to the southeast. The wind rose for the Alviso meteorological station is provided in Appendix B.

The modeling analysis also considered the spatial distribution and elevation of each emitting source in relation to the sensitive receptors. To accommodate the model's Cartesian grid format, direction-dependent calculations were obtained by identifying the Universal Transverse Mercator (UTM) coordinates for each source location. In addition, digital elevation model (DEM) data for the area were obtained and included in the model runs to account for complex terrain. An emission release height of 4.15 meters was used as representative of the stack exhaust height for off-road construction equipment, and an initial vertical dispersion parameter of 1.93 m was used, per CARB guidance (2000). For mobile sources, two sets of volume sources were created. One set representing the motor vehicles traveling along I-280 and Wolfe Road was used to characterize emissions of TOG and $PM_{2.5}$. For this set of sources, a release height of 0.60 meters was used (CARB, 2000). The second set of sources representing truck traffic was used to characterize emissions of DPM. For this run, a release height of 4.15 m was used.

To determine contaminant impacts during construction hours, the model's Season-Hour-Day (SHRDOW) scalar option was invoked to predict flagpole-level concentrations (1.5 m for ground-floor receptors) for emissions generated between the hours of 7:00 AM and 4:00 PM, with a 1-hour lunch break. In addition, a scalar factor was applied to the risk calculations to account for the number of days residents are exposed to construction emissions per year. For operational impacts, the model's Hour-of-Day (HROFDY) scalar option was invoked to predict concentrations from variable hourly emissions from vehicular traffic.

For all modeling runs, a unit emission rate of 1 gm/sec was used. The unit emission rates were proportioned over the poly-area sources for on-site construction emissions, and divided between the volume sources for off-site highway and roadway emissions. The maximum ISCST3 concentrations from the output files were then multiplied by the emission rates calculated in Appendix A to obtain the maximum flagpole-level concentrations at the maximum exposed receptor (MER). The model output DPM and $PM_{2.5}$ concentrations for the on-site construction sources are provided in Table C1 of Appendix C, and the model output for the

5. Dispersion Modeling

operational emission sources is provided in Table D2 of Appendix D. The ISCST3 model output for the emission sources is presented in Appendix B. For the construction analysis, the configuration of the sources and the receptor locations are presented in Figure 1.

6. Risk Characterizations

6.1 CARCINOGENIC CHEMICAL RISK

A threshold of ten in a million (10E–06) has been established as a level posing no significant risk for exposures to carcinogens.

Health risks associated with exposure to carcinogenic compounds can be defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. The cancer risk probability is determined by multiplying the chemical's annual concentration by its cancer potency factor (CPF), a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It is an upper-limit estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ($\mu g/m^3$) over a lifetime of 70 years.

Recent guidance from OEHHA recommends a refinement to the standard point estimate approach with the use of age-specific breathing rates and age sensitivity factors (ASFs) to assess risk for susceptible subpopulations such as children. For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose for each age group. Once determined, contaminant dose is multiplied by the cancer potency factor in units of inverse dose expressed in milligrams per kilogram per day $(mg/kg/day)^{-1}$ to derive the cancer risk estimate. Therefore, to accommodate the unique exposures associated with the proposed school population, the following dose algorithm was used:

$$\text{Dose}_{\text{AIR,per age group}} = \left(C_{\text{air}} \times \text{EF} \times \left[\frac{\text{BR}}{\text{BW}}\right] \times \text{A} \times \text{CF}\right)$$

Where:

Dose_{AIR}	=	dose by inhalation (mg/kg-day), per age group
C_{air}	=	concentration of contaminant in air ($\mu g/m^3$)
EF	=	exposure frequency (number of days/365 days)
BR/BW	=	daily breathing rate normalized to body weight (L/kg-day)
A	=	inhalation absorption factor (default = 1)
CF	=	conversion factor ($1x10^{-6}$, μg to mg, L to m^3)

The inhalation absorption factor (A) is a unitless factor that is only used if the cancer potency factor included a correction for absorption across the lung. For this assessment, the default value of 1 was used. The exposure frequency (EF) of 0.96 is used to represent 350 days per year to allow for a two week period away from home each year (OEHHA, 2015). The 95th percentile daily breathing rates (BR/BW), exposure duration (ED), age sensitivity factors (ASFs), and fraction of time at home (FAH) for the various age groups are provided herein:

6. Risk Characterizations

Age Groups	BR/BW (L/kg-day)	ED	ASF	FAH
Third trimester	361	0.25	10	0.85
0-2 age group	1,090	2	10	0.85
2-9 age group	861	7	3	0.72
2-16 age group	745	14	3	0.72
16-30 age group	335	14	1	0.73
16-70 age group	290	54	1	0.73

For construction analysis, the exposure duration spans the length of construction (e.g. 1,174 days or 3.2 years). To calculate the overall cancer risk, the risk for each appropriate age group is calculated per the following equation:

$$\text{Cancer Risk}_{\text{AIR}} = \text{Dose}_{\text{AIR}} \times \text{CPF} \times \text{ASF} \times \text{FAH} \times \frac{\text{ED}}{AT}$$

Where:

Dose_{AIR} = dose by inhalation (mg/kg-day), per age group
CPF = cancer potency factor, chemical-specific $(\text{mg/kg-day})^{-1}$
ASF = age sensitivity factor, per age group
FAH = fraction of time at home, per age group
ED = exposure duration (years)
AT = averaging time period over which exposure duration is averaged (always 70 years)

The CPFs used in the assessment were obtained from OEHHA guidance. The excess lifetime cancer risks during the construction period and during the operational phase to the maximally exposed resident were calculated based on the factors provided above. The cancer risks for each age group are summed to estimate the total cancer risk for each toxic chemical species. For purposes of this assessment, the calculated residential cancer risks associated with construction activities are based on the 3rd trimester, 0 to 2 year old, and 2 to 16 year old age groups. The final step converts the cancer risk in scientific notation to a whole number that expresses the cancer risk in "chances per million" by multiplying the cancer risk by a factor of $1x10^6$ (i.e. 1 million).

The assessment was based on reasonable maximum exposure, defined as the "highest exposure that is reasonably expected to occur" for a given receptor population. Lifetime risk values for the adult residents were calculated for an exposure of 350 days per year for 30 years (high-end estimate) in accordance with OEHHA's guidance. Additionally, the maximum lifetime residency exposure (70-year scenario) and the average residency exposure (9-year scenario) risk values were determined for informational purposes. It was assumed that the MER spent 24 hours/day, 7 days/week, 350 days/year outside near the residence, as per default exposure parameters.

CARB's Hotspots Analysis and Reporting Program (HARP), Risk Assessment Standalone Tool was used to calculate the cancer risk values (CARB, 2015). For construction, the calculated results are provided in Appendix C. For the operational phase, the calculated results are provided in Appendix D.

6.2 NON-CARCINOGENIC HAZARDS

An evaluation of the potential non-cancer effects of chronic and acute chemical exposures was also conducted. Adverse health effects are evaluated by comparing the annual receptor level (flagpole) concentration of each chemical compound with the appropriate reference exposure limit (REL). Available RELs promulgated by OEHHA were considered in the assessment.

To quantify non-carcinogenic impacts, the hazard index approach was used. The hazard index assumes that chronic and acute sub-threshold exposures adversely affect a specific organ or organ system (toxicological endpoint). For each discrete chemical exposure, target organs presented in regulatory guidance were used. To calculate the hazard index, each chemical concentration or dose is divided by the appropriate toxicity value. For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds one, a health hazard is presumed to exist.

For construction, the chronic hazard analysis for DPM is provided in Appendix C. For the operational phase, the chronic and acute hazard analysis is provided in Appendix D. CARB's HARP, Risk Assessment Standalone Tool was used to calculate the chronic and acute health risk values (CARB, 2015).

6.3 CRITERIA POLLUTANTS

The BAAQMD has recently incorporated $PM_{2.5}$ into the District's CEQA significance thresholds due to recent studies that show adverse health impacts from exposure to this pollutant. An incremental increase of greater than 0.3 $\mu g/m^3$ for the annual average $PM_{2.5}$ concentration is considered to be a significant impact. The modeling results for $PM_{2.5}$ are summarized in Tables 5 and 6.

6. Risk Characterizations

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7. Conclusions

7.1 CONSTRUCTION HEALTH RISKS

The residential health risk values are based on the maximum modeled receptor concentration over the construction exposure period, conservatively assuming a 24-hour per day outdoor exposure and averaged over a 70-year lifetime. According to the modeling results and as shown in Figure 1, the MER is the northeastern-most residential building of the Arioso Apartment complex to the west of the project site. Results of the health risk assessment shown in Table 6 indicate that the maximum incremental cancer risk during the construction phase of the project at the MER is 11.5 per million (11.5E-05), which is above the significance threshold of 10 per million.

For non-carcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for the MER. Therefore, chronic non-carcinogenic hazards are within acceptable limits. Lastly, the highest $PM_{2.5}$ annual concentration at the MER is 0.09 $\mu g/m^3$ and would not exceed the BAAQMD significance threshold of 0.3 $\mu g/m^3$.

Table 6 Construction HRA Results

Receptor	Cancer Risk (per million)	Chronic Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)[1]
Resident (Maximum Exposed Receptor)	11.5	0.033	0.09
BAAQMD Threshold	10	1.0	0.3
Exceeds Threshold	Yes	No	No

Sources: Lakes AERMOD View, 9.1, 2015.
[1] From year 2017 which represents the highest maximum annual $PM_{2.5}$ concentration.

As the calculated cancer risk at the MER exceeds the 10 per million significance threshold, the following mitigation measure is recommended to minimize risk impacts:

MIT During construction, the construction contractor shall use construction equipment fitted with engines that meet the United States Environmental Protection Agency (EPA)-Certified Tier 3 emissions standards for equipment of 50 horsepower or more. The construction contractor shall maintain a list of all operating equipment in use on the project site for verification by the City of Cupertino Building Division official or their designee. The construction equipment list shall state the makes, models, and number of construction equipment onsite. Equipment shall properly service and maintain construction equipment in accordance with the manufacturer's recommendations. The construction contractor shall also ensure that all nonessential idling of construction equipment is restricted to five minutes or less in compliance with CARB Rule 2449. Prior to issuance of any construction

7. Conclusions

permit, the construction contractor shall ensure that all construction plans submitted to the City of Cupertino Planning Department and/or Building Division clearly show the requirement for EPA Tier 3 or higher emissions standards for construction equipment over 50 horsepower.

Tables 7 and 8 show the average daily emission rates and calculated cancer risk at the MER, respectively, with incorporation of the mitigation measure.

Table 7 Construction Activity – Average Daily Emission Rates With Mitigation

Parameter – Year	Onsite Emissions (lbs/day)[1]	Total Offsite Emissions (lbs/day)[1]
DPM – 2017	1.60	0.67
$PM_{2.5}$ - 2017	2.65	2.08
DPM – 2018	1.24	0.45
$PM_{2.5}$ - 2018	1.24	4.05
DPM – 2019	0.87	0.29
$PM_{2.5}$ - 2019	0.87	2.76
DPM – 2020	0.94	0.27
$PM_{2.5}$ - 2020	0.94	2.79

Presented emission rates are average daily emissions.
Source: CalEEMod 2013.2.2.
[1] Accounts for emissions reductions from implementation of mitigation which requires use of Tier 3 rated engines for construction equipment with a horsepower rating of 50 horsepower or higher.

Table 8 Construction HRA Results – With Mitigation

Receptor	Cancer Risk (per million)	Chronic Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)[1]
Resident (Maximum Exposed Receptor)	6.9	0.019	0.05
BAAQMD Threshold	10	1.0	0.3
Exceeds Threshold	No	No	No

Sources: Lakes AERMOD View, 9.1, 2015.
[1] From year 2017 which represents the highest maximum annual $PM_{2.5}$ concentration.

As shown in Table 8, incorporation of mitigation would reduce cancer risk at the MER to 6.9 per million (6.9E-06), which is below the 10 per million significance threshold. The results of this construction health risk assessment indicate that the project would have a less than significant impact with respect to chronic non-carcinogenic hazard and $PM_{2.5}$ impacts for the surrounding sensitive receptors during the 38.5-month construction period. Additionally, with incorporation of mitigation, excess cancer risk would also be less than significant to the nearby sensitive receptors. It should also be noted that conservative assumptions were used in preparing the health risk assessment. For example, residential receptors are assumed to spend 24 hours per

day outdoors and exposed to construction emissions whereas California residents typically will spend a maximum of just over one hour per day outdoors at their residences (CARB, 1991), which would result in much lower estimated risk values.

7.2 OPERATIONAL HEALTH RISKS

For the operational HRA, the refined modeling results from individual and cumulative emission sources, provided in Table 9, indicate that the excess cancer risk from each individual mobile and stationary source within 1,000 feet of the site is less than the threshold of 10 in a million for a lifetime cancer risk and less than the non-carcinogenic chronic and acute hazard indexes of 1.0. The $PM_{2.5}$ concentrations for all individual emission sources are below the significance threshold of 0.3 μg/m³. In addition, the cumulative health risks from all evaluated emission sources are below the cumulative significance thresholds.

Table 9 Operational HRA Results

Receptor	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ (μg/m³)
REFINED MODELING VALUES [1]				
Interstate 280	1.89 ([2])	0.002	0.005	0.11
Wolfe Road	3.98 ([2])	0.004	0.006	0.11
SCREENING VALUES [3]				
Pruneridge Avenue	6.16	0.030	0.030	0.16
Apple Campus 2	1.15	0.302	0.302	0.17
BAAQMD Threshold	10	1.0	1.0	0.3
Exceeds Threshold	No	No	No	No
Total Health Risk Values – All Sources	13.2	0.34	0.34	0.54
BAAQMD Threshold	100	10.0	10.0	0.8
Exceeds Threshold	No	No	No	No

Sources:
1 Lakes AERMOD View, 9.1, 2015.
2 Residential cancer risks for Interstate 280 and Wolfe Road were determined using the high-end residency exposure duration of 30-years (OEHHA, 2015). For informational purposes, the maximum 70-year lifetime and 9-year average residency time cancer risks were calculated and were also below BAAQMD's significance thresholds. These values are provided in Appendix D.
3 BAAQMD Roadway Screening Analysis Calculator (2015); Apple Campus 2 Project EIR, L. Air Quality (LSA Associates, Inc., 2013).

Based on a comparison to the carcinogenic and non-carcinogenic thresholds established by OEHHA and BAAQMD, hazardous air emissions generated from the stationary and mobile sources within a 1,000-foot radius are not anticipated to pose an actual or potential endangerment to residents of the project site and no mitigation measures are required.

7. Conclusions

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Appendix A. Emission Rate Calculations

Appendix

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Construction Emissions - DPM and PM2.5
Input to ISCST3 Model

Onsite Construction Emissions		DPM [1]	$PM_{2.5}$ [2]
2017 Onsite Emissions	Average Daily Emissions (lbs/day)	3.81	4.58
	Average Daily Emissions (lbs/hr)	4.76E-01	5.72E-01
	Emission Rate (g/s)	6.00E-02	7.21E-02
2018 Onsite Emissions	Average Daily Emissions (lbs/day)	1.94	1.82
	Average Daily Emissions (lbs/hr)	2.43E-01	2.28E-01
	Emission Rate (g/s)	3.06E-02	2.87E-02
2019 Onsite Emissions	Average Daily Emissions (lbs/day)	1.22	1.15
	Average Daily Emissions (lbs/hr)	1.53E-01	1.44E-01
	Emission Rate (g/s)	1.93E-02	1.81E-02
2020 Onsite Emissions	Average Daily Emissions (lbs/day)	1.15	1.09
	Average Daily Emissions (lbs/hr)	1.44E-01	1.36E-01
	Emission Rate (g/s)	1.82E-02	1.71E-02

Note: Emissions assumed to be evenly distributed over entire construction phase area.

Offsite Construction Emissions		DPM [1]	$PM_{2.5}$ [2]
2017 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.668	2.08
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	1.08E-02	3.35E-02
	Emission Rate (lbs/hr)	1.34E-03	4.19E-03
	Emission Rate (g/s)	1.69E-04	5.28E-04
2018 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.45	4.05
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	7.30E-03	6.52E-02
	Emission Rate (lbs/hr)	9.12E-04	8.15E-03
	Emission Rate (g/s)	1.15E-04	1.03E-03
2019 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.29	2.76
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	4.69E-03	4.44E-02
	Emission Rate (lbs/hr)	5.87E-04	0.005549819
	Emission Rate (g/s)	7.39E-05	6.99E-04
2020 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.268	2.79
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	4.32E-03	4.49E-02
	Emission Rate (lbs/hr)	5.40E-04	5.61E-03
	Emission Rate (g/s)	6.81E-05	7.07E-04

Note: Emissions evenly distributed over 19 modeled volume sources.

	2017	2018	2019	2020
Hours per work day (7:00 AM to 4:00 PM, 1-hr lunch break) [3]	8	8	8	8
Total calendar days per year	170	365	365	274
Residential Risk Scalar [4]	0.47	1.00	1.00	0.75

	Demolition	Grading
Haul Length (miles)	14	20
Number of Haul Trips	1,656	18,750

Proportioned Hauling Length (miles)	**19.5**
Haul Length within 1,000 ft of Site (mile)[5]	**0.31**

[1] DPM emissions taken as PM_{10} exhaust emissions from CalEEMod average daily emissions.

[2] $PM_{2.5}$ emissions taken as total $PM_{2.5}$ (exhaust and fugitive dust) emissions from CalEEMod average daily emissions.

[3] Work hours applied in Season-Hour-Day of the Week (SHRDOW) variable emissions module in ISCST3 model (see App B - ISCST3 Output Files).

[4] Residential risk scalars determined for each year of construction to adjust receptor exposures to the exposure durations for each construction year (see App C - Risk Calculations).

[5] Emissions from CalEEMod offsite average daily emissions, which is based on haul truck trip distance of 19.5 miles proportioned to evaluate emissions from the **0.31-**mile route within 1,000 of the project site.

Mitigated Construction Emissions - DPM and PM2.5
Tier 3 Engines (for equipment > 55 HP)
Input to ISCST3 Model

Onsite Construction Emissions		DPM [1]	$PM_{2.5}$ [2]
2017 Onsite Emissions	Average Daily Emissions (lbs/day)	1.60	2.65
	Average Daily Emissions (lbs/hr)	2.00E-01	3.31E-01
	Emission Rate (g/s)	2.53E-02	4.17E-02
2018 Onsite Emissions	Average Daily Emissions (lbs/day)	1.24	1.24
	Average Daily Emissions (lbs/hr)	1.55E-01	1.55E-01
	Emission Rate (g/s)	1.96E-02	1.96E-02
2019 Onsite Emissions	Average Daily Emissions (lbs/day)	0.87	0.87
	Average Daily Emissions (lbs/hr)	1.09E-01	1.09E-01
	Emission Rate (g/s)	1.38E-02	1.38E-02
2020 Onsite Emissions	Average Daily Emissions (lbs/day)	0.94	0.94
	Average Daily Emissions (lbs/hr)	1.17E-01	1.17E-01
	Emission Rate (g/s)	1.48E-02	1.48E-02

Note: Emissions assumed to be evenly distributed over entire construction phase area.

Offsite Construction Emissions		DPM [1]	$PM_{2.5}$ [2]
2017 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.668	2.08
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	1.08E-02	3.35E-02
	Emission Rate (lbs/hr)	1.34E-03	4.19E-03
	Emission Rate (g/s)	1.69E-04	5.28E-04
2018 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.45	4.05
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	7.30E-03	6.52E-02
	Emission Rate (lbs/hr)	9.12E-04	8.15E-03
	Emission Rate (g/s)	1.15E-04	1.03E-03
2019 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.29	2.76
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	4.69E-03	4.44E-02
	Emission Rate (lbs/hr)	5.87E-04	0.005549819
	Emission Rate (g/s)	7.39E-05	6.99E-04
2020 Offsite Emissions	Haul Length Daily Emissions (lbs/day)	0.268	2.79
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	4.32E-03	4.49E-02
	Emission Rate (lbs/hr)	5.40E-04	5.61E-03
	Emission Rate (g/s)	6.81E-05	7.07E-04

Note: Emissions evenly distributed over 19 modeled volume sources.

	2017	2018	2019	2020
Hours per work day (7:00 AM to 4:00 PM, 1-hr lunch break) [3]	8	8	8	8
Total calendar days per year	170	365	365	274
Residential Risk Scalar [4]	0.47	1.00	1.00	0.75

	Demolition	Grading
Haul Length (miles)	14	20
Number of Haul Trips	1,656	18,750

Proportioned Hauling Length (miles)	**19.5**
Haul Length within 1,000 ft of Site (mile)[5]	**0.31**

[1] DPM emissions taken as PM_{10} exhaust emissions from CalEEMod average daily emissions.

[2] $PM_{2.5}$ emissions taken as total $PM_{2.5}$ (exhaust and fugitive dust) emissions from CalEEMod average daily emissions.

[3] Work hours applied in Season-Hour-Day of the Week (SHRDOW) variable emissions module in ISCST3 model (see App B - ISCST3 Output Files).

[4] Residential risk scalars determined for each year of construction to adjust receptor exposures to the exposure durations for each construction year (see App C - Risk Calculations).

[5] Emissions from CalEEMod offsite average daily emissions, which is based on haul truck trip distance of 19.5 miles proportioned to evaluate emissions from the **0.31-**mile route within 1,000 of the project site.

Criteria Air Pollutant Emissions Summary - Construction

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Unmigated Run

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
avg lbs/day										
Total	42.52	56.93	92.75	0.21	10.32	2.19	12.51	2.83	2.04	4.88
BAAQMD Threshold	54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold	No	Yes	NA	NA	NA	No	No	NA	No	NA

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
avg lbs/day										
Total Onsite	37.34	30.48	24.99	0.04	0.48	1.80	2.28	0.15	1.69	1.84
Total Offsite	5.19	26.45	67.75	0.17	10.01	0.39	10.40	2.71	0.36	3.07

FOR CONSTRUCTION RISK ASSESSMENT

Onsite Details with Best Control Measures for Fugitive Dust

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
avg lbs/day										
2017 Onsite	6.98	75.62	55.34	0.07	3.38	3.81	7.19	1.05	3.53	4.58
2018 Onsite	3.22	28.95	24.65	0.04	0.00	1.94	1.94	0.00	1.82	1.82
2019 Onsite	2.23	19.50	16.56	0.03	0.00	1.22	1.22	0.00	1.15	1.15
2020 Onsite	148.11	19.50	18.11	0.03	0.00	1.15	1.15	0.00	1.09	1.09

Offsite Details with Best Control Measures for Fugitive Dust

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
avg lbs/day										
2017 Offsite	4.85	51.30	57.29	0.17	5.36	0.67	6.03	1.47	0.62	2.08
2018 Offsite	6.97	30.17	91.63	0.22	13.42	0.45	13.88	3.63	0.42	4.05
2019 Offsite	4.35	18.86	58.00	0.15	9.19	0.29	9.49	2.49	0.27	2.76
2020 Offsite	4.13	16.40	55.35	0.15	9.39	0.27	9.66	2.54	0.25	2.79

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
avg lbs/day										
TOTAL 2017	11.84	126.93	112.62	0.24	8.73	4.48	13.21	2.51	4.14	6.66
TOTAL 2018	10.19	59.13	116.29	0.25	13.42	2.39	15.82	3.63	2.24	5.87
TOTAL 2019	6.58	38.35	74.56	0.17	9.19	1.51	10.71	2.49	1.42	3.91
TOTAL 2020	152.23	35.90	73.45	0.18	9.39	1.42	10.81	2.54	1.33	3.87

Criteria Air Pollutant Emissions Summary - Construction (Mitigated - Tier 3 Engines for Eq. >50 HP)

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Migated Run

						Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5
	avg lbs/day	ROG	NOx	CO	SO2	PM10	PM10	Total	PM2.5	PM2.5	Total
Total		40.39	44.79	92.06	0.21	10.32	1.50	11.82	2.83	1.47	4.30
BAAQMD Threshold		54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold		No	No	NA	NA	NA	No	No	NA	No	NA

						Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5
	avg lbs/day	ROG	NOx	CO	SO2	PM10	PM10	Total	PM2.5	PM2.5	Total
Total Onsite		35.20	18.34	24.30	0.04	0.48	1.11	1.59	0.15	1.11	1.26
Total Offsite		5.19	26.45	67.75	0.17	10.01	0.39	10.40	2.71	0.36	3.07

FOR CONSTRUCTION RISK ASSESSMENT

Onsite Details with Tier 3 Engines for Eq. >50 HP and Best Control Measures for Fugitive Dust

						Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5
	avg lbs/day	ROG	NOx	CO	SO2	PM10	PM10	Total	PM2.5	PM2.5	Total
2017 Onsite		1.68	33.62	44.27	0.07	3.38	1.60	4.98	1.05	1.60	2.65
2018 Onsite		1.04	18.90	25.71	0.04	0.00	1.24	1.24	0.00	1.24	1.24
2019 Onsite		0.92	13.44	17.37	0.03	0.00	0.87	0.87	0.00	0.87	0.87
2020 Onsite		146.87	14.78	19.44	0.03	0.00	0.94	0.94	0.00	0.94	0.94

Offsite Details with Tier 3 Engines for Eq. >50 HP and Best Control Measures for Fugitive Dust

						Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5
	avg lbs/day	ROG	NOx	CO	SO2	PM10	PM10	Total	PM2.5	PM2.5	Total
2017 Offsite		4.85	51.30	57.29	0.17	5.36	0.67	6.03	1.47	0.62	2.08
2018 Offsite		6.97	30.17	91.63	0.22	13.42	0.45	13.88	3.63	0.42	4.05
2019 Offsite		4.35	18.86	58.00	0.15	9.19	0.29	9.49	2.49	0.27	2.76
2020 Offsite		4.13	16.40	55.35	0.15	9.39	0.27	9.66	2.54	0.25	2.79

						Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5
	avg lbs/day	ROG	NOx	CO	SO2	PM10	PM10	Total	PM2.5	PM2.5	Total
TOTAL 2017		6.54	84.92	101.55	0.24	8.73	2.27	11.01	2.51	2.22	4.73
TOTAL 2018		8.01	49.07	117.34	0.25	13.42	1.70	15.12	3.63	1.66	5.29
TOTAL 2019		5.27	32.29	75.38	0.17	9.19	1.17	10.36	2.49	1.14	3.63
TOTAL 2020		151.00	31.18	74.79	0.18	9.39	1.21	10.60	2.54	1.19	3.73

Draft Construction Health Risk Screening Table

1 foot = 0.3048 meters

		DPM		PM2.5	Acrolein (2)		
		Cancer Risk w/ASF (3)	Chronic Hazard Index	Annual Average Concentration (µg/m3)	Acute Hazard Index	Chronic Hazard Index	Offest Required for Combined Risk w/ ASF (3)
Project Acreage	12.4	137	17	112	87	7	137
Distance in feet		450	56	368	287	23	450

Project Scenario			Minimum offset distance (meters) from the project fence line to ensure that a sensitive receptor would have a less than significant impact (1)					
			DPM		PM2.5	Acrolein (2)		
Type	# of Units/ Square Feet	Project Site Acres	Cancer Risk w/ASF (3)	Chronic Hazard Index	Annual Average Concentration (µg/m3)	Acute Hazard Index	Chronic Hazard Index	Offest Required for Combined Risk w/ ASF (3)
Residential	5	1.7	85	7	75	55	1	95
	10	3.3	100	7	75	55	1	100
	25	8.3	125	16	100	85	6	125
	50	16.7	150	18	125	90	8	150
	100	33.3	175	20	150	90	11	175
	250	83.3	300	25	250	150	12	300
	500	166.7	400	35	300	150	20	400
	1,000	333.3	500	40	600	175	25	600
	2,000	666.7	700	45	900	225	25	900
	5,000	1666.7	1000	40	800	225	25	1000
Commercial	5,000	0.2	100	8	75	55	1	100
	10,000	0.5	100	8	75	55	1	100
	30,000	1.4	100	8	80	55	1	100
	60,000	2.8	100	9	85	55	1	100
	100,000	4.6	150	19	125	85	8	150
	300,000	13.8	200	25	150	85	13	200
	500,000	23	225	19	175	85	8	225
	1,000,000	45.9	300	25	200	90	14	300
	3,000,000	137.7	500	35	400	150	20	500
	7,000,000	321.4	600	35	400	175	20	600
Industrial	5,000	0.2	100	10	85	55	2	100
	10,000	0.5	100	10	85	55	2	100
	30,000	1.4	100	10	90	55	2	100
	60,000	2.8	100	11	95	55	2	100
	100,000	4.6	175	20	125	85	10	175
	300,000	13.8	200	25	175	85	15	200
	500,000	23	250	20	175	85	9	250
	1,000,000	45.9	300	25	200	90	15	300
	3,000,000	137.7	500	35	400	150	20	500
	6,000,000	275.5	600	35	400	150	19	600

Source: Bay Area Air Quality Management District (BAAQMD). 2010, May. Screening Tables for Air Toxics Evaluation During Construction, Version 1.0.

Notes:

1. The BAAQMD thresholds are an increased cancer risk of 10 in a million, a hazard index of 1, and a PM2.5 annual average concentration of 0.3 µg/m3.

2. The OEHHA proposes weighting cancer risk by a factor of 10 for exposures that occur from the third trimester of pregnanacy to 2 years of age, and by a factor of 3 for exposures that occur from 2 years through 15 years of age. These factors are call Age Sensitivity Factors (ASF). The methodology for applying ASF to cancer risk is discussed in BAAQMD's CEQA Construction Screening Approach.

3. Acrolein was chosen because it has the greatest non-cancer health risks for toxic air contaminants contained in diesel exhaust.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara
Roadway Direction	North-South
Side of the Roadway	East
Distance from Roadway	35 feet
Annual Average Daily Traffic (ADT)	55,988

Results

Santa Clara County

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.728 ($\mu g/m^3$)

Cancer Risk

30.92 (per million)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using CALINE4 air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara
Roadway Direction	East-West
Side of the Roadway	South
Distance from Roadway	50 feet
Annual Average Daily Traffic (ADT)	12,624

Results

Santa Clara County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.156 ($\mu g/m^3$)

Cancer Risk

6.16 (per million)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using CALINE4 air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD. This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

For guidance on conducting a risk & hazard screening, including for roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart. Also see the District's Recommended Methods for Screening and Modeling Lo

Table A: Requestor Contact Information	
Contact Name:	Steve Bush
Affiliation:	PlaceWorks
Phone:	510-848-3815, ext. 316
Email:	sbush@placeworks.com
Date of Request	12/17/2015
Project Name:	Residential Development
Address:	19500 Pruneridge Ave
City:	Cupertino
County:	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.):	Residential Development
Project size (# of units, or building square feet):	12.4 acres, 942 dwelling units
Comments:	
Please provide emission rate and generator testing information, or risk values for any additionally identified sources. See attached map.	

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in Table A. Incomplete forms will not be processed. Please include a project site map.
2. Download and install the free program Google Earth, http://www.google.com/earth/download/ge/, and then download the county specific Google Earth stationary source application files from the District's website, http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx. The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.
3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.
4. Identify stationary sources near the project. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm the source's address location. Please report any mapping errors to the District.
5. List the stationary source information in Table B Section 1 below.
6. Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.
7. Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Alison Kirk at 415-749-5169, or akirk@baaqmd.gov .

Table B: Stationary Sources

Table B Section 1: Requestor fills out these columns based on Google Earth data | **Table B Section 2: BAAQMD returns form with additional information in these columns as needed**

Distance from Receptor (feet)	Plant # or Gas Dispensary #	Facility Name	Street Address	Screening Level Cancer Risk (1)	Screening Level Hazard Index (1)	Screening Level PM2.5 (1)	Permit #s (2)	Source #s (2)	Fuel Code (3)	Type of Source(s) (4)	Status/Comments
300	18440	Apple Inc.	10500 Ridgeview Court	27.65	0.010	0.006				see attached sheet	Note that this site is closed as of 10/17/13

Vehicle Mix Worksheet - I-280

Table A: Peak Hourly Traffic Volumes

Route	Post Mile	CalTrans Data Year	Peak Hour Traffic (veh/hr)	Truck Percentage (%)	Buildout Year	Peak Hour Traffic (veh/hr)	Annual Increase in Traffic (%)
280	8.375	2014	12,500	3.16%	2020	13,572	1.4%

Sources:

Peak hour traffic data from CalTrans, Traffic Data Branch (2014). Website: http://traffic-counts.dot.ca.gov.

Truck percentage from CalTrans, Traffic Data Branch (2014). Website: http://traffic-counts.dot.ca.gov.

Annual traffic increase based on projected growth rate of 1.4 per year from CalTrans, Traffic Data Branch (2014).

Table B: Highway Parameters

Link/Segment	Link length (m)	Width of roadway (m)	Source Separation (m)	Freeway Configuration	Mile Post
I-280	713	41	41	Above-Grade	8.375

Table C: Segment Volumes

Link/Segment	Period Length (years)	Peak Hour All Vehicles	Peak Hour TOG Vehicles	Peak Hour Diesel Vehicles [5]
I-280 2020 [1]	5	**13,572**	**13,143**	429
I-280 2025 [1]	5	14,535	14,076	459
I-280 2030 [1]	5	15,567	15,075	492
I-280 2035 [1]	5	16,671	16,145	527
I-280 2040 [1]	5	17,855	17,290	564
I-280 2045 [1]	5	19,122	18,517	604
I-680 2050-2089 [1]	40	20,479	19,832	647
70-year weighted average [2]	70	18,654	**18,064**	**589**
30-year weighted average [3]	30	16,220	**15,708**	**513**
9-year weighted average [4]	9	14,000	**13,558**	**442**

1 Increases in AADT based on projected growth rate of 1.4% per year from CalTrans, Traffic Data Branch (2014).

2 Represents the 70-year weighted average traffic volumes, accounting for annual increases in projected traffic.

3 Represents the 30-year weighted average traffic volumes, accounting for annual increases in projected traffic.

4 Represents the 9-year weighted average traffic volumes, accounting for annual increases in projected traffic.

Vehicle Mix Worksheet - Wolfe Rd

Table A: Peak Hourly Traffic Volumes

Route	Intersection	TIA Data Year	Peak Hour Traffic (veh/hr)	Truck Percentage (%)	Buildout Year	Peak Hour Traffic (veh/hr)	Annual Increase in Traffic (%)
Wolfe Rd	Pruneridge Ave	2015	5,036	3.51%	2020	5,393	1.4%

Sources:

Peak hour traffic data from Hamptons Apartment Complex Draft TIA (2015).
Estimated Truck Percentage along non-state highways in Santa Clara County by California Motor Vehicle's Stock Travel and Fuel Forecaost (MVSTAFF) report for 2006 (BAAQMD's Recommended Methods for Screening and Modeling Local Risks and Hazards, May 2012).

Annual traffic increase based on projected growth rate of 1.4 per year from CalTrans, Traffic Data Branch (2014).

Table B: Highway Parameters

Link/Segment	Link length (m)	Width of roadway (m)	Source Separation (m)	Freeway Configuration	Mile Post
Wolfe Rd	857	25	25	At-Grade	Pruneridge Ave

Table C: Segment Volumes

Link/Segment	Period Length (years)	Peak Hour All Vehicles	Peak Hour TOG Vehicles	Peak Hour Diesel Vehicles [5]
Wolfe Rd 2020 [1]	5	**5,393**	**5,204**	189
Wolfe Rd 2025 [1]	5	5,776	5,573	203
Wolfe Rd 2030 [1]	5	6,186	5,969	217
Wolfe Rd 2035 [1]	5	6,625	6,393	233
Wolfe Rd 2040 [1]	5	7,095	6,846	249
Wolfe Rd 2045 [1]	5	7,599	7,332	267
Wolfe Rd 2050-2089 [1]	40	8,138	7,852	286
70-year weighted average [2]	70	7,413	**7,153**	**260**
30-year weighted average [3]	30	6,446	**6,220**	**226**
9-year weighted average [4]	9	5,564	**5,368**	**195**

1 Increases in AADT based on projected growth rate of 1.4% per year from CalTrans, Traffic Data Branch (2014).

2 Represents the 70-year weighted average traffic volumes, accounting for annual increases in projected traffic.

3 Represents the 30-year weighted average traffic volumes, accounting for annual increases in projected traffic.

4 Represents the 9-year weighted average traffic volumes, accounting for annual increases in projected traffic.

30-Year Weighted Average Emission Factors

Weighting Emission Factors

Adjusting the EMFAC2014 emission factors to account for reductions in factors over the exposure duration.

Risk Year	Modeling Year	Period	WF	Weighting Factor		55 mph - Emission Factors (g/mi)		35 mph - Emission Factors (g/mi)	
						TAC's		TAC's	
				Period	Factor	TOG-gas	PM10-dsl	TOG-gas	PM10-dsl
1	2020	1	0.033	2020-2024	0.167	**0.0321**	0.0265	**0.0399**	0.0242
2	2021	1	0.033						
3	2022	1	0.033						
4	2023	1	0.033						
5	2024	1	0.033						
6	2025	1	0.033	2025-2029	0.167	0.0241	0.0059	0.0299	0.0074
7	2026	1	0.033						
8	2027	1	0.033						
9	2028	1	0.033						
10	2029	1	0.033						
11	2030	1	0.033	2030-2034	0.167	0.0205	0.0047	0.0254	0.0060
12	2031	1	0.033						
13	2032	1	0.033						
14	2033	1	0.033						
15	2034	1	0.033						
16	2035	1	0.033	2035-2039	0.167	0.0186	0.0041	0.0228	0.0053
17	2036	1	0.033						
18	2037	1	0.033						
19	2038	1	0.033						
20	2039	1	0.033						
21-25	2040-2044	5	0.167	2040-2044	0.167	0.0176	0.0039	0.0216	0.0049
26-30	2045-2049	5	0.167	2045-2049	0.167	0.0172	0.0038	0.0211	0.0048
30-year average[1]		30	1.0		1.0	**0.0217**	**0.0082**	**0.0268**	**0.0088**

[1] Represent the 30-year weighted average emission factors.

ASF - age sensitivity factor
WF - period weighting factor

70-Year Weighted Average Emission Factors

Weighting Emission Factors

Adjusting the EMFAC2014 emission factors to account for reductions in factors over the exposure duration.

Risk Year	Modeling Year	Period	WF	Weighting Factor		55 mph - Emission Factors (g/mi)		35 mph - Emission Factors (g/mi)	
						TAC's		TAC's	
				Period	Factor	TOG-gas	PM10-dsl	TOG-gas	PM10-dsl
1	2020	1	0.014	2020-2024	0.071	**0.0321**	0.0265	**0.0399**	0.0242
2	2021	1	0.014						
3	2022	1	0.014						
4	2023	1	0.014						
5	2024	1	0.014						
6	2025	1	0.014	2025-2029	0.071	0.0241	0.0059	0.0299	0.0074
7	2026	1	0.014						
8	2027	1	0.014						
9	2028	1	0.014						
10	2029	1	0.014						
11	2030	1	0.014	2030-2034	0.071	0.0205	0.0047	0.0254	0.0060
12	2031	1	0.014						
13	2032	1	0.014						
14	2033	1	0.014						
15	2034	1	0.014						
16	2035	1	0.014	2035-2039	0.071	0.0186	0.0041	0.0228	0.0053
17	2036	1	0.014						
18	2037	1	0.014						
19	2038	1	0.014						
20	2039	1	0.014						
21-25	2040-2044	5	0.071	2040-2044	0.071	0.0176	0.0039	0.0216	0.0049
26-30	2045-2049	5	0.071	2045-2049	0.071	0.0172	0.0038	0.0211	0.0048
31-70	2050-2089	40	0.571	2050-2089	0.571	0.0170	0.0037	0.0209	0.0048
70-year average[1]		70	1.0		1.0	**0.0190**	**0.0056**	**0.0234**	**0.0065**

[1] Represent the 70-year weighted average emission factors.

ASF - age sensitivity factor
WF - period weighting factor

9-Year Weighted Average Emission Factors

Weighting Emission Factors

Adjusting the EMFAC2014 emission factors to account for reductions in factors over the exposure duration.

Risk Year	Modeling Year	Period	WF	Weighting Factor		55 mph - Emission Factors (g/mi)		35 mph - Emission Factors (g/mi)	
						TAC's		TAC's	
				Period	Factor	TOG-gas	PM10-dsl	TOG-gas	PM10-dsl
1	2020	1	0.111	2020-2024	0.556	**0.0321**	0.0265	**0.0399**	0.0242
2	2021	1	0.111						
3	2022	1	0.111						
4	2023	1	0.111						
5	2024	1	0.111						
6	2025	1	0.111	2025-2029	0.444	0.0241	0.0059	0.0299	0.0074
7	2026	1	0.111						
8	2027	1	0.111						
9	2028	1	0.111						
9-year average[1]		9	1.0		1.0	**0.0285**	**0.0173**	**0.0355**	**0.0167**

[1] Represent the 9-year weighted average emission factors.

ASF - age sensitivity factor
WF - period weighting factor

On-Road Mobile Sources
Emission Rate Computation

TOG Emissions

Emission Rate (gr/sec) = ((Emission Factor x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

1 I-280

Mile Post 8.375

Link Length (meters)	713

Chronic - Long-term Emissions

Peak Hour Volume/Baseline (VPH) - 70-year	18,064
Emission Factor (gr/mi) - 70-year	0.0190
Peak Hour Emission Rate (gr/sec) - 70-year	4.22E-02
Peak Hour Volume/Baseline (VPH) - 30-year	15,708
Emission Factor (gr/mi) - 30-year	0.0217
Peak Hour Emission Rate (gr/sec) - 30-year	**4.19E-02**
Peak Hour Volume/Baseline (VPH) - 9-year	13,558
Emission Factor (gr/mi) - 9-year	0.0285
Peak Hour Emission Rate (gr/sec) - 9-year	4.76E-02

Acute - Short-term Emissions

Peak Hour Volume/Baseline (VPH) - 2020	13,143
Emission Factor (gr/mi) - 2020	0.0321
Peak Hour Emission Rate (gr/sec) - 2020	**5.19E-02**

2 Wolfe Rd

Intersection: Pruneridge Ave

Link Length (meters)	857

Chronic - Long-term Emissions

Peak Hour Volume/Baseline (VPH) - 70-year	7,153
Emission Factor (gr/mi) - 70-year	0.0234
Peak Hour Emission Rate (gr/sec) - 70-year	2.48E-02
Peak Hour Volume/Baseline (VPH) - 30-year	6,220
Emission Factor (gr/mi) - 30-year	0.0268
Peak Hour Emission Rate (gr/sec) - 30-year	**2.47E-02**
Peak Hour Volume/Baseline (VPH) - 9-year	5,368
Emission Factor (gr/mi) - 9-year	0.0285
Peak Hour Emission Rate (gr/sec) - 9-year	2.27E-02

Acute - Short-term Emissions

Peak Hour Volume/Baseline (VPH) - 2020	5,204
Emission Factor (gr/mi) - 2020	0.0355
Peak Hour Emission Rate (gr/sec) - 2020	**2.73E-02**

On-Road Mobile Sources
Emission Rate Computation

DPM Emissions

Emission Rate (gr/sec) = ((Emission Factor x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

1 I-280

Mile Post 8.375

Link Length (meters)	713
Peak Hour Volume/Baseline (VPH) - 70-year	589
Emission Factor (gr/mi) - 70-year	0.0056
Peak Hour Emission Rate (gr/sec) - 70-year	4.07E-04
Peak Hour Volume/Baseline (VPH) - 30-year	513
Emission Factor (gr/mi) - 30-year	0.0082
Peak Hour Emission Rate (gr/sec) - 30-year	**5.14E-04**
Peak Hour Volume/Baseline (VPH) - 9-year	442
Emission Factor (gr/mi) - 9-year	0.0173
Peak Hour Emission Rate (gr/sec) - 9-year	9.44E-04

2 Wolfe Rd

Intersection: Pruneridge Ave

Link Length (meters)	857
Peak Hour Volume/Baseline (VPH) - 70-year	260
Emission Factor (gr/mi) - 70-year	0.0065
Peak Hour Emission Rate (gr/sec) - 70-year	2.50E-04
Peak Hour Volume/Baseline (VPH) - 30-year	226
Emission Factor (gr/mi) - 30-year	0.0088
Peak Hour Emission Rate (gr/sec) - 30-year	**2.94E-04**
Peak Hour Volume/Baseline (VPH) - 9-year	195
Emission Factor (gr/mi) - 9-year	0.0167
Peak Hour Emission Rate (gr/sec) - 9-year	4.84E-04

On-Road Mobile Souces
Emission Rate Computation

Particulate ($PM_{2.5}$) Emissions

For PM2.5 Reentrainment: Emission Factor (gr/mile) = (Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$

Particulate PM2.5 Base Emission Factor (gr/mi)	0.17
Road Surface Silt Loading (gr/m2)	0.02
Gross Vehicle Weight (tons)	2.4
PM2.5 Reentrainment Emission Factor (gr/mi)	0.012

Emission Rate (gr/sec) = ((Emission Factor x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

1 **I-280**
Mile Post 8.375

Link Length (meters)	713
Peak Hour Volume/Baseline (VPH) - 2020	13,572
PM2.5 Vehicular Emission Factor (gr/mi) - 2020	0.0032
Peak Hour Pollutant Reentrainment Emission Rate (gr/sec)	1.96E-02
Peak Hour Pollutant Emission Rate (gr/sec)	5.34E-03
Peak Hour Pollutant Emission Rate Total (gr/sec)	**2.49E-02**

2 **Wolfe Rd**
Intersection: Pruneridge Ave

Link Length (meters)	857
Peak Hour Volume/Baseline (VPH) - 2020	5,393
PM2.5 Vehicular Emission Factor (gr/mi) - 2020	0.0032
Peak Hour Pollutant Reentrainment Emission Rate (gr/sec)	4.26E-03
Peak Hour Pollutant Emission Rate (gr/sec)	2.55E-03
Peak Hour Pollutant Emission Rate Total (gr/sec)	**6.82E-03**

Initial Sigma Computation

Vertical Sigma Calculations - At-Grade or Above Grade Roadway

Initial Horizontal Dispersion Parameter (Sigma Y)
SY = (source separation distance)/2.15

Initial Vertical Dispersion Parameter (Sigma Z)
$SZ = (1.8 + 0.11(TR)) \times (60/30)^{0.2}$
TR = W2/U

Where:
W2 = traveled way half width (m)
U = average wind speed (m/s)

1 **I-280**
Mile Post 8.375

Width of Traveled Way (m)	41
Average Wind Speed (m/s)	3.00
Source Separation Distance (m)	41

SY = **19.1**
SZ = **2.93**

2 **Wolfe Rd**
Intersection: Pruneridge Ave

Width of Traveled Way (m)	25
Average Wind Speed (m/s)	3.00
Source Separation Distance (m)	25

SY = **11.6**
SZ = **2.59**

Caltrans Performance Measurement System (PeMS)

PeMS - 8/1/2015 - 10/31/2015: I-280							Normalizing Factors		
	All Vehicles - Daily VMT			Trucks Daily VMT			HROFDAY Scalars		
Hour	Southbound	Northbound	Total VMT	Southbound	Northbound	Total VMT	Hour	Vehicles	Trucks
0	318	356	674	2	16	18	1	0.117	0.097
1	183	217	400	2	9	11	2	0.069	0.059
2	134	181	315	2	6	8	3	0.055	0.042
3	141	146	287	3	4	7	4	0.050	0.038
4	337	167	505	7	6	13	5	0.087	0.070
5	1,279	260	1,539	22	15	37	6	0.267	0.199
6	3,004	548	3,552	48	25	73	7	0.615	0.393
7	3,942	1,342	5,284	72	47	119	8	0.915	0.637
8	3,634	1,789	5,424	91	60	150	9	0.939	0.806
9	3,996	1,758	5,754	93	61	153	10	0.997	0.822
10	3,529	1,670	5,199	66	61	127	11	0.901	0.681
11	2,940	1,717	4,657	50	67	117	12	0.807	0.630
12	2,798	1,834	4,632	46	73	118	13	0.802	0.635
13	2,789	1,924	4,713	45	75	120	14	0.816	0.642
14	2,905	2,409	5,314	41	87	128	15	0.920	0.689
15	3,048	2,545	5,594	38	142	180	16	0.969	0.967
16	3,151	2,536	5,687	38	148	185	17	0.985	0.993
17	3,268	2,505	**5,773**	36	150	**187**	**18**	**1.000**	**1.000**
18	2,839	2,436	5,276	30	137	167	19	0.914	0.894
19	2,134	2,210	4,344	24	97	121	20	0.752	0.650
20	1,566	1,518	3,083	16	45	62	21	0.534	0.331
21	1,399	1,154	2,552	13	34	48	22	0.442	0.255
22	1,018	911	1,929	8	24	32	23	0.334	0.171
23	575	593	1,168	5	17	22	24	0.202	0.117
Max	3,996	2,545	5,773	93	150	187			

PeMS Report Description

Report	Aggregates>Time Series
Report link	http://pems.dot.ca.gov/?report_form=1&dnode=VDS&content=loops&station_id=400499&s_time_id
Report generated	12/28/2015 10:31
PeMS version	caltrans_pems-14.0.53

Report Parameters
I-280
Northbound Segment

Parameter	Value
Quantity	Vehicle Miles Traveled (VMT)
Data	103,680 Lane Points
Data Quality	84% Observed
Segment Type	VDS
Segment Name	Mainline VDS 400499 - WOLFE RD
Timezone	America/Los_Angeles
Start Date	2015-07-31T17:00:00-07:00
End Date	2015-10-31T16:59:59-07:00
Day of Week	Su,Mo,Tu,We,Th,Fr,Sa
Granularity	hour

Report Parameters
I-280
Southbound Segment

Parameter	Value
Quantity	Vehicle Miles Traveled (VMT)
Data	103,680 Lane Points
Data Quality	66.5% Observed
Segment Type	VDS
Segment Name	Mainline VDS 400673 - Wolfe Rd rm-s-loop
Timezone	America/Los_Angeles
Start Date	2015-07-31T17:00:00-07:00
End Date	2015-10-31T16:59:59-07:00
Day of Week	Su,Mo,Tu,We,Th,Fr,Sa
Granularity	hour

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10	PM2.5	CO	NOx
Gas	**0.0399**				
DSL		**0.0242**			
Total		0.0034	**0.0032**	0.9766	0.3386

		35 MPH											
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted	PM2.5 (g/mi)	PM2.5 Weighted	CO (g/mi)	CO Weighted	NOx (g/mi)	NOx Weighted
HHDT	GAS		1475	0.636733	939	0.000804	1	0.00074	1	31.89674	47032	3.272794	4826
HHDT	DSL	0.510	117055	0.219952	25747	0.020416	2390	0.01953	2286	0.795229	93086	4.470334	523277
LDA	GAS		1729865	0.016834	29121	0.001646	2848	0.00151	2619	0.701261	1213087	0.058267	100794
LDA	DSL	0.081	18582	0.021244	395	0.01049	195	0.01004	187	0.21951	4079	0.096094	1786
LDT1	GAS		113417	0.040948	4644	0.002403	273	0.00221	251	1.455715	165103	0.134476	15252
LDT1	DSL	0.000	86	0.168225	14	0.116433	10	0.11140	10	0.769864	66	0.838979	72
LDT2	GAS		549379	0.023186	12738	0.001597	877	0.00147	807	0.920568	505741	0.09419	51746
LDT2	DSL	0.005	1071	0.017892	19	0.006136	7	0.00587	6	0.130913	140	0.047694	51
LHDT1	GAS		19481	0.073198	1426	0.001353	26	0.00124	24	1.317082	25658	0.373189	7270
LHDT1	DSL	0.100	23035	0.108481	2499	0.021752	501	0.02081	479	0.462737	10659	2.588525	59627
LHDT2	GAS		3881	0.031766	123	0.001031	4	0.00095	4	0.598114	2321	0.216207	839
LHDT2	DSL	0.046	10524	0.078868	830	0.016562	174	0.01585	167	0.322483	3394	1.516776	15962
MCY	GAS		15944	2.686564	42835	0.001819	29	0.00170	27	18.18581	289960	1.124698	17933
MDV	GAS		316394	0.052414	16584	0.001801	570	0.00166	525	1.594617	504527	0.185371	58650
MDV	DSL	0.027	6216	0.014476	90	0.005937	37	0.00568	35	0.198452	1234	0.046227	287
MH	GAS		2821	0.175433	495	0.001887	5	0.00174	5	3.739099	10547	0.632485	1784
MH	DSL	0.003	682	0.09195	63	0.095335	65	0.09121	62	0.390204	266	4.598245	3135
MHDT	GAS		7179	0.115978	833	0.001075	8	0.00099	7	2.442685	17536	0.589566	4232
MHDT	DSL	0.191	43757	0.122239	5349	0.042696	1868	0.04085	1787	0.367337	16074	2.225239	97371
OBUS	GAS		4285	0.046871	201	0.000772	3	0.00071	3	0.971928	4165	0.276071	1183
OBUS	DSL	0.019	4464	0.124521	556	0.018849	84	0.01803	80	0.393348	1756	3.621275	16164
SBUS	GAS		1877	0.130309	245	0.000997	2	0.00092	2	2.923407	5487	0.763776	1434
SBUS	DSL	0.015	3476	0.087311	303	0.028628	100	0.02739	95	0.269537	937	6.020163	20926
UBUS	GAS		280	0.507337	142	0.001205	0	0.00111	0	3.430806	959	0.93723	262
UBUS	DSL	0.003	675	0.425846	288	0.196517	133	0.18802	127	3.062767	2069	14.28256	9646
Gas Total			2766278		110325		4647		4274		2505557		264234
DSL Total		1.00	229625		36152		5563		5323		420325		750276

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0299**	
DSL		**0.0074**

		35 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		1716	0.44302	760	0.000937	2
HHDT	DSL	0.519	132380	0.152109	20136	0.00651	862
LDA	GAS		1732648	0.010867	18829	0.001638	2838
LDA	DSL	0.085	21580	0.011354	245	0.004779	103
LDT1	GAS		109161	0.022472	2453	0.001958	214
LDT1	DSL	0.000	75	0.110729	8	0.074962	6
LDT2	GAS		560053	0.015061	8435	0.001623	909
LDT2	DSL	0.005	1215	0.016011	19	0.004889	6
LHDT1	GAS		14691	0.042967	631	0.001199	18
LHDT1	DSL	0.092	23534	0.079769	1877	0.015901	374
LHDT2	GAS		3766	0.013516	51	0.000985	4
LHDT2	DSL	0.045	11422	0.0574	656	0.01224	140
MCY	GAS		16146	2.607748	42104	0.001992	32
MDV	GAS		312210	0.028033	8752	0.001677	524
MDV	DSL	0.030	7599	0.010176	77	0.00378	29
MH	GAS		2555	0.073338	187	0.001337	3
MH	DSL	0.003	649	0.072821	47	0.064262	42
MHDT	GAS		8041	0.040596	326	0.001015	8
MHDT	DSL	0.186	47406	0.046338	2197	0.003427	162
OBUS	GAS		4612	0.023918	110	0.000937	4
OBUS	DSL	0.019	4919	0.065634	323	0.004248	21
SBUS	GAS		2197	0.069011	152	0.000853	2
SBUS	DSL	0.014	3508	0.076955	270	0.019755	69
UBUS	GAS		357	0.099742	36	0.001	0
UBUS	DSL	0.002	597	0.331132	198	0.137779	82
Gas Total			2768150		82827		4558
DSL Total		1.00	254885		26054		1896

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0254**	
DSL		**0.0060**

		35 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		1893	0.413629	783	0.001029	2
HHDT	DSL	0.526	143080	0.150443	21525	0.00607	869
LDA	GAS		1726770	0.00774	13365	0.001272	2197
LDA	DSL	0.084	22956	0.006706	154	0.001926	44
LDT1	GAS		108949	0.013211	1439	0.001425	155
LDT1	DSL	0.000	59	0.025736	2	0.010425	1
LDT2	GAS		575607	0.010645	6128	0.001274	733
LDT2	DSL	0.005	1263	0.015314	19	0.004357	6
LHDT1	GAS		12115	0.021294	258	0.001112	13
LHDT1	DSL	0.089	24159	0.062117	1501	0.011596	280
LHDT2	GAS		3809	0.007041	27	0.001025	4
LHDT2	DSL	0.044	12092	0.047978	580	0.00976	118
MCY	GAS		16404	2.570862	42172	0.002088	34
MDV	GAS		315839	0.018704	5907	0.001345	425
MDV	DSL	0.031	8399	0.007494	63	0.00219	18
MH	GAS		2490	0.026031	65	0.001111	3
MH	DSL	0.002	635	0.057671	37	0.039594	25
MHDT	GAS		8694	0.019935	173	0.00104	9
MHDT	DSL	0.184	49987	0.046358	2317	0.003346	167
OBUS	GAS		4838	0.015975	77	0.001023	5
OBUS	DSL	0.019	5190	0.064081	333	0.004147	22
SBUS	GAS		2478	0.030471	75	0.000886	2
SBUS	DSL	0.013	3537	0.063424	224	0.011498	41
UBUS	GAS		414	0.031638	13	0.001015	0
UBUS	DSL	0.002	548	0.252924	139	0.085189	47
	Gas Total		2780299		70483		3583
	DSL Total	1.00	271906		26894		1637

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2035
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0228**	
DSL		**0.0053**

		35 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		1997	0.419313	837	0.001065	2
HHDT	DSL	0.532	153173	0.149887	22959	0.005845	895
LDA	GAS		1741691	0.005867	10218	0.000928	1615
LDA	DSL	0.083	23847	0.005205	124	0.001139	27
LDT1	GAS		110738	0.007882	873	0.00099	110
LDT1	DSL	0.000	61	0.017256	1	0.005504	0
LDT2	GAS		592194	0.007997	4736	0.000939	556
LDT2	DSL	0.005	1299	0.015286	20	0.004345	6
LHDT1	GAS		10996	0.010099	111	0.001049	12
LHDT1	DSL	0.087	24984	0.052979	1324	0.008812	220
LHDT2	GAS		3928	0.004838	19	0.001054	4
LHDT2	DSL	0.044	12648	0.044834	567	0.008345	106
MCY	GAS		16811	2.554602	42946	0.002142	36
MDV	GAS		324865	0.013465	4374	0.001027	334
MDV	DSL	0.031	8950	0.006279	56	0.001529	14
MH	GAS		2535	0.017028	43	0.00106	3
MH	DSL	0.002	644	0.049744	32	0.026348	17
MHDT	GAS		9151	0.014446	132	0.001063	10
MHDT	DSL	0.183	52718	0.045554	2401	0.003234	170
OBUS	GAS		5022	0.013635	68	0.00106	5
OBUS	DSL	0.019	5484	0.06031	331	0.003852	21
SBUS	GAS		2699	0.012087	33	0.000968	3
SBUS	DSL	0.012	3556	0.050711	180	0.005421	19
UBUS	GAS		454	0.023515	11	0.001043	0
UBUS	DSL	0.002	523	0.191259	100	0.041694	22
Gas Total			2823081		64402		2689
DSL Total		1.00	287887		28095		1517

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2040
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0216**	
DSL		**0.0049**

		35 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2063	0.425824	879	0.001077	2
HHDT	DSL	0.539	163645	0.149221	24419	0.005766	944
LDA	GAS		1765101	0.005018	8857	0.000726	1282
LDA	DSL	0.081	24482	0.004642	114	0.000835	20
LDT1	GAS		113028	0.005926	670	0.00077	87
LDT1	DSL	0.000	62	0.015587	1	0.004538	0
LDT2	GAS		606161	0.006602	4002	0.000734	445
LDT2	DSL	0.004	1331	0.015294	20	0.004353	6
LHDT1	GAS		10592	0.005347	57	0.001044	11
LHDT1	DSL	0.085	25725	0.048403	1245	0.007226	186
LHDT2	GAS		4033	0.004221	17	0.001071	4
LHDT2	DSL	0.043	13042	0.043932	573	0.007578	99
MCY	GAS		17219	2.547321	43862	0.002172	37
MDV	GAS		333631	0.0102	3403	0.000821	274
MDV	DSL	0.031	9336	0.00561	52	0.001147	11
MH	GAS		2608	0.012996	34	0.001061	3
MH	DSL	0.002	660	0.046328	31	0.020579	14
MHDT	GAS		9461	0.012749	121	0.001073	10
MHDT	DSL	0.183	55500	0.044595	2475	0.003134	174
OBUS	GAS		5173	0.013122	68	0.001072	6
OBUS	DSL	0.019	5799	0.060178	349	0.00383	22
SBUS	GAS		2877	0.011507	33	0.001043	3
SBUS	DSL	0.012	3565	0.042771	152	0.003027	11
UBUS	GAS		483	0.021675	10	0.001061	1
UBUS	DSL	0.002	503	0.154048	77	0.017659	9
Gas Total			2872431		62012		2165
DSL Total		1.00	303651		29509		1495

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2045
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0211**	
DSL		**0.0048**

		35 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2108	0.426806	899	0.001079	2
HHDT	DSL	0.546	174014	0.148785	25891	0.005754	1001
LDA	GAS		1788583	0.004786	8560	0.000642	1147
LDA	DSL	0.078	24921	0.004495	112	0.000748	19
LDT1	GAS		114824	0.005341	613	0.000669	77
LDT1	DSL	0.000	64	0.015415	1	0.004442	0
LDT2	GAS		616280	0.006123	3773	0.000647	399
LDT2	DSL	0.004	1356	0.015305	21	0.004363	6
LHDT1	GAS		10378	0.004542	47	0.001054	11
LHDT1	DSL	0.083	26324	0.04605	1212	0.006382	168
LHDT2	GAS		4113	0.004084	17	0.001077	4
LHDT2	DSL	0.042	13317	0.043717	582	0.007287	97
MCY	GAS		17517	2.543439	44553	0.002182	38
MDV	GAS		339237	0.007971	2704	0.000708	240
MDV	DSL	0.030	9613	0.005319	51	0.000969	9
MH	GAS		2665	0.011913	32	0.001069	3
MH	DSL	0.002	672	0.044539	30	0.017942	12
MHDT	GAS		9669	0.012031	116	0.001078	10
MHDT	DSL	0.183	58371	0.04421	2581	0.003094	181
OBUS	GAS		5278	0.012502	66	0.001076	6
OBUS	DSL	0.019	6122	0.060769	372	0.003878	24
SBUS	GAS		2991	0.01149	34	0.001075	3
SBUS	DSL	0.011	3566	0.042256	151	0.002906	10
UBUS	GAS		502	0.014974	8	0.001069	1
UBUS	DSL	0.002	505	0.138826	70	0.006666	3
Gas Total			2914144		61422		1942
DSL Total		1.00	318845		31073		1531

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2050
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

35 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0209**	
DSL		**0.0048**

		35 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2137	0.428003	915	0.00108	2
HHDT	DSL	0.553	183701	0.14822	27228	0.005749	1056
LDA	GAS		1805060	0.004733	8543	0.000617	1114
LDA	DSL	0.076	25189	0.004469	113	0.000727	18
LDT1	GAS		116136	0.005207	605	0.00063	73
LDT1	DSL	0.000	64	0.015414	1	0.004447	0
LDT2	GAS		622726	0.005996	3734	0.000621	387
LDT2	DSL	0.004	1372	0.015322	21	0.004377	6
LHDT1	GAS		10306	0.004138	43	0.001067	11
LHDT1	DSL	0.080	26706	0.044697	1194	0.005895	157
LHDT2	GAS		4166	0.004035	17	0.001079	4
LHDT2	DSL	0.041	13494	0.043684	589	0.007214	97
MCY	GAS		17687	2.540066	44925	0.002188	39
MDV	GAS		342012	0.0068	2326	0.000651	223
MDV	DSL	0.030	9813	0.005227	51	0.000901	9
MH	GAS		2707	0.011874	32	0.001075	3
MH	DSL	0.002	682	0.043577	30	0.0162	11
MHDT	GAS		9807	0.01195	117	0.001079	11
MHDT	DSL	0.183	60766	0.044139	2682	0.003085	187
OBUS	GAS		5343	0.012046	64	0.001077	6
OBUS	DSL	0.019	6449	0.060569	391	0.003867	25
SBUS	GAS		3056	0.011477	35	0.00108	3
SBUS	DSL	0.011	3566	0.042419	151	0.002922	10
UBUS	GAS		516	0.014938	8	0.001073	1
UBUS	DSL	0.002	513	0.132445	68	0.00538	3
	Gas Total		2941658		61363		1876
	DSL Total	1.00	332315		32519		1581

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10	PM2.5	CO	NOx
Gas	**0.0321**				
DSL		**0.0265**			
Total		0.0034	**0.0032**	0.7553	0.2925

			55 MPH									
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted	PM2.5 (g/mi)	PM2.5 Weighted	CO (g/mi)	CO Weighted	NOx (g/mi)	NOx Weighted
HHDT	GAS		1752	0.498402	873	0.00063	1	0.00058	1	23.94764	41951	3.020406	5291
HHDT	DSL	0.514	170659	0.059548	10162	0.018156	3098	0.01737	2964	0.230332	39308	3.174282	541719
LDA	GAS		2262645	0.013155	29765	0.001284	2906	0.00118	2672	0.530248	1199763	0.054127	122469
LDA	DSL	0.073	24306	0.015281	371	0.009005	219	0.00862	209	0.150049	3647	0.099584	2420
LDT1	GAS		148348	0.031811	4719	0.001866	277	0.00172	255	1.1558	171461	0.13131	19480
LDT1	DSL	0.000	112	0.151723	17	0.106468	12	0.10186	11	0.891811	100	0.980692	110
LDT2	GAS		718582	0.018045	12967	0.001244	894	0.00114	822	0.698341	501815	0.088159	63350
LDT2	DSL	0.004	1401	0.010725	15	0.004963	7	0.00475	7	0.077706	109	0.041748	58
LHDT1	GAS		13109	0.06147	806	0.001087	14	0.00100	13	1.234858	16188	0.373453	4896
LHDT1	DSL	0.091	30210	0.089389	2700	0.018928	572	0.01811	547	0.498367	15056	3.024218	91361
LHDT2	GAS		2612	0.025764	67	0.000812	2	0.00075	2	0.50833	1328	0.210418	550
LHDT2	DSL	0.042	13801	0.059803	825	0.013918	192	0.01332	184	0.316307	4365	1.749575	24146
MCY	GAS		20855	2.264857	47233	0.001537	32	0.00144	30	18.50802	385984	1.147873	23939
MDV	GAS		413839	0.041803	17300	0.001413	585	0.00130	538	1.282291	530663	0.178213	73752
MDV	DSL	0.025	8131	0.008769	71	0.004777	39	0.00457	37	0.114041	927	0.040218	327
MH	GAS		3565	0.15159	540	0.001561	6	0.00144	5	3.914432	13956	0.656014	2339
MH	DSL	0.003	1116	0.063473	71	0.1155	129	0.11050	123	0.275261	307	4.07047	4541
MHDT	GAS		9073	0.091919	834	0.000847	8	0.00078	7	1.919827	17419	0.561303	5093
MHDT	DSL	0.216	71600	0.057856	4142	0.058074	4158	0.05556	3978	0.228162	16336	1.63713	117219
OBUS	GAS		5416	0.036567	198	0.000604	3	0.00056	3	0.736076	3987	0.260262	1410
OBUS	DSL	0.026	8512	0.04467	380	0.017824	152	0.01705	145	0.149392	1272	2.985491	25412
SBUS	GAS		453	0.100501	46	0.000778	0	0.00072	0	2.156582	977	0.719588	326
SBUS	DSL	0.003	839	0.049294	41	0.030418	26	0.02910	24	0.139265	117	5.745223	4822
UBUS	GAS		425	0.444097	189	0.000992	0	0.00091	0	3.340168	1420	0.994175	423
UBUS	DSL	0.003	1027	0.329429	338	0.171001	176	0.16360	168	1.740548	1787	14.20354	14581
Gas Total			3600674		115538		4729		4349		2505292		323523
DSL Total		1.00	331713		19136		8779		8399		464950		826510

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0241**	
DSL		**0.0059**

		55 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2038	0.345808	705	0.000731	1
HHDT	DSL	0.525	194266	0.032906	6392	0.005139	998
LDA	GAS		2266284	0.008461	19175	0.001277	2893
LDA	DSL	0.076	28226	0.007285	206	0.003954	112
LDT1	GAS		142782	0.017252	2463	0.001514	216
LDT1	DSL	0.000	98	0.097703	10	0.068277	7
LDT2	GAS		732543	0.011709	8577	0.001264	926
LDT2	DSL	0.004	1589	0.008839	14	0.003774	6
LHDT1	GAS		9885	0.03564	352	0.000953	9
LHDT1	DSL	0.083	30864	0.059958	1851	0.013356	412
LHDT2	GAS		2534	0.010858	28	0.000771	2
LHDT2	DSL	0.041	14980	0.037659	564	0.009773	146
MCY	GAS		21119	2.17862	46009	0.001653	35
MDV	GAS		408367	0.021753	8883	0.001305	533
MDV	DSL	0.027	9939	0.005854	58	0.002977	30
MH	GAS		3229	0.061548	199	0.001072	3
MH	DSL	0.003	1062	0.047104	50	0.077349	82
MHDT	GAS		10163	0.031787	323	0.000794	8
MHDT	DSL	0.210	77570	0.013807	1071	0.002727	212
OBUS	GAS		5829	0.018629	109	0.000732	4
OBUS	DSL	0.025	9403	0.021152	199	0.003503	33
SBUS	GAS		530	0.053225	28	0.000666	0
SBUS	DSL	0.002	847	0.036653	31	0.021534	18
UBUS	GAS		542	0.08374	45	0.000786	0
UBUS	DSL	0.002	907	0.244333	222	0.118505	108
	Gas Total		3605845		86897		4633
	DSL Total	1.00	369753		10667		2163

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0205**	
DSL		**0.0047**

		55 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2249	0.322773	726	0.000803	2
HHDT	DSL	0.533	210797	0.031579	6657	0.004793	1010
LDA	GAS		2258596	0.006034	13628	0.000992	2240
LDA	DSL	0.076	30026	0.003712	111	0.001482	44
LDT1	GAS		142504	0.010158	1447	0.001105	157
LDT1	DSL	0.000	77	0.018005	1	0.008877	1
LDT2	GAS		752887	0.008286	6239	0.000993	748
LDT2	DSL	0.004	1652	0.008141	13	0.003271	5
LHDT1	GAS		8152	0.017019	139	0.000872	7
LHDT1	DSL	0.080	31684	0.041834	1325	0.009397	298
LHDT2	GAS		2563	0.005534	14	0.0008	2
LHDT2	DSL	0.040	15858	0.027797	441	0.007512	119
MCY	GAS		21456	2.138307	45880	0.00172	37
MDV	GAS		413114	0.014473	5979	0.001046	432
MDV	DSL	0.028	10986	0.00403	44	0.001655	18
MH	GAS		3147	0.020136	63	0.000867	3
MH	DSL	0.003	1039	0.034734	36	0.045129	47
MHDT	GAS		10988	0.015448	170	0.000812	9
MHDT	DSL	0.207	81793	0.013734	1123	0.002634	215
OBUS	GAS		6115	0.012401	76	0.000798	5
OBUS	DSL	0.025	9940	0.020545	204	0.003397	34
SBUS	GAS		598	0.023501	14	0.000691	0
SBUS	DSL	0.002	854	0.023893	20	0.012295	10
UBUS	GAS		629	0.024401	15	0.000792	0
UBUS	DSL	0.002	834	0.176672	147	0.073665	61
	Gas Total		3622999		74390		3643
	DSL Total	1.00	395539		10125		1864

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2035
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0186**	
DSL		**0.0041**

		55 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2373	0.327209	776	0.000831	2
HHDT	DSL	0.539	226263	0.031039	7023	0.004615	1044
LDA	GAS		2278112	0.004583	10442	0.000724	1648
LDA	DSL	0.074	31192	0.002786	87	0.00086	27
LDT1	GAS		144844	0.006126	887	0.000771	112
LDT1	DSL	0.000	79	0.009986	1	0.004326	0
LDT2	GAS		774583	0.006239	4832	0.000732	567
LDT2	DSL	0.004	1699	0.008102	14	0.003256	6
LHDT1	GAS		7399	0.007778	58	0.000818	6
LHDT1	DSL	0.078	32765	0.032423	1062	0.00693	227
LHDT2	GAS		2643	0.003727	10	0.000823	2
LHDT2	DSL	0.040	16588	0.024454	406	0.006307	105
MCY	GAS		21989	2.120546	46629	0.00176	39
MDV	GAS		424919	0.010449	4440	0.0008	340
MDV	DSL	0.028	11706	0.003346	39	0.00115	13
MH	GAS		3205	0.013172	42	0.000827	3
MH	DSL	0.003	1054	0.028348	30	0.027063	29
MHDT	GAS		11565	0.011175	129	0.000829	10
MHDT	DSL	0.205	86261	0.013458	1161	0.002531	218
OBUS	GAS		6347	0.010548	67	0.000827	5
OBUS	DSL	0.025	10514	0.019259	202	0.003138	33
SBUS	GAS		652	0.009322	6	0.000755	0
SBUS	DSL	0.002	859	0.015632	13	0.004914	4
UBUS	GAS		690	0.018136	13	0.000814	1
UBUS	DSL	0.002	795	0.125104	99	0.037649	30
	Gas Total		3679322		68331		2734
	DSL Total	1.00	419775		10138		1736

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2040
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0176**	
DSL		**0.0039**

		55 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2451	0.332289	815	0.00084	2
HHDT	DSL	0.546	242160	0.030806	7460	0.004549	1102
LDA	GAS		2308733	0.003925	9061	0.000567	1308
LDA	DSL	0.072	32023	0.002471	79	0.000628	20
LDT1	GAS		147840	0.004628	684	0.000601	89
LDT1	DSL	0.000	81	0.008366	1	0.003425	0
LDT2	GAS		792852	0.00516	4091	0.000572	454
LDT2	DSL	0.004	1741	0.008103	14	0.003262	6
LHDT1	GAS		7127	0.004118	29	0.000815	6
LHDT1	DSL	0.076	33737	0.027689	934	0.005568	188
LHDT2	GAS		2714	0.003251	9	0.000836	2
LHDT2	DSL	0.039	17105	0.023471	401	0.005692	97
MCY	GAS		22522	2.112533	47579	0.001783	40
MDV	GAS		436385	0.007944	3466	0.00064	279
MDV	DSL	0.028	12211	0.002981	36	0.000862	11
MH	GAS		3296	0.010053	33	0.000828	3
MH	DSL	0.002	1079	0.025479	27	0.018992	20
MHDT	GAS		11958	0.009862	118	0.000837	10
MHDT	DSL	0.205	90815	0.013161	1195	0.002445	222
OBUS	GAS		6538	0.010151	66	0.000837	5
OBUS	DSL	0.025	11121	0.019343	215	0.003146	35
SBUS	GAS		694	0.008875	6	0.000814	1
SBUS	DSL	0.002	861	0.012621	11	0.002359	2
UBUS	GAS		734	0.016717	12	0.000828	1
UBUS	DSL	0.002	764	0.090134	69	0.015438	12

Gas Total		3743846	65970	2200
DSL Total	1.00	443699	10444	1715

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2045
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0172**	
DSL		**0.0038**

		55 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2504	0.333056	834	0.000842	2
HHDT	DSL	0.552	257823	0.030804	7942	0.004538	1170
LDA	GAS		2339447	0.003743	8757	0.0005	1171
LDA	DSL	0.070	32597	0.002385	78	0.000562	18
LDT1	GAS		150188	0.004177	627	0.000522	78
LDT1	DSL	0.000	83	0.008181	1	0.003331	0
LDT2	GAS		806088	0.004789	3860	0.000505	407
LDT2	DSL	0.004	1774	0.008105	14	0.003268	6
LHDT1	GAS		6983	0.003499	24	0.000822	6
LHDT1	DSL	0.074	34523	0.02525	872	0.004851	167
LHDT2	GAS		2768	0.003146	9	0.00084	2
LHDT2	DSL	0.037	17464	0.023214	405	0.005463	95
MCY	GAS		22912	2.108119	48300	0.00179	41
MDV	GAS		443718	0.006234	2766	0.000552	245
MDV	DSL	0.027	12574	0.002821	35	0.000727	9
MH	GAS		3368	0.009215	31	0.000834	3
MH	DSL	0.002	1100	0.023916	26	0.015382	17
MHDT	GAS		12221	0.009307	114	0.000841	10
MHDT	DSL	0.205	95512	0.013041	1246	0.00241	230
OBUS	GAS		6671	0.009671	65	0.000839	6
OBUS	DSL	0.025	11743	0.019565	230	0.003191	37
SBUS	GAS		722	0.008861	6	0.000839	1
SBUS	DSL	0.002	861	0.012462	11	0.002262	2
UBUS	GAS		763	0.011548	9	0.000834	1
UBUS	DSL	0.002	767	0.075885	58	0.005282	4

Gas Total		3798352	65403	1972
DSL Total	1.00	466822	10918	1757

Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2050
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

55 mph - Freeway Running Emission Rates

	TOG	PM10
Gas	**0.0170**	
DSL		**0.0037**

		55 MPH					
		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2539	0.33399	848	0.000842	2
HHDT	DSL	0.559	272446	0.030836	8401	0.004531	1235
LDA	GAS		2360999	0.003702	8740	0.000482	1137
LDA	DSL	0.068	32947	0.002367	78	0.000544	18
LDT1	GAS		151904	0.004073	619	0.000491	75
LDT1	DSL	0.000	84	0.008168	1	0.003332	0
LDT2	GAS		814518	0.00469	3820	0.000484	395
LDT2	DSL	0.004	1795	0.008113	15	0.003278	6
LHDT1	GAS		6935	0.003187	22	0.000832	6
LHDT1	DSL	0.072	35023	0.023817	834	0.004429	155
LHDT2	GAS		2803	0.003108	9	0.000842	2
LHDT2	DSL	0.036	17697	0.023147	410	0.005405	96
MCY	GAS		23134	2.104335	48681	0.001795	42
MDV	GAS		447348	0.005318	2379	0.000508	227
MDV	DSL	0.026	12836	0.002769	36	0.000675	9
MH	GAS		3421	0.009185	31	0.000839	3
MH	DSL	0.002	1116	0.023133	26	0.012766	14
MHDT	GAS		12394	0.009244	115	0.000842	10
MHDT	DSL	0.204	99431	0.013017	1294	0.002402	239
OBUS	GAS		6753	0.009319	63	0.000841	6
OBUS	DSL	0.025	12371	0.01946	241	0.003174	39
SBUS	GAS		738	0.008852	7	0.000843	1
SBUS	DSL	0.002	861	0.01251	11	0.002274	2
UBUS	GAS		785	0.011521	9	0.000837	1
UBUS	DSL	0.002	779	0.07013	55	0.004029	3

Gas Total		3834272	65342	1905
DSL Total	1.00	487386	11400	1815

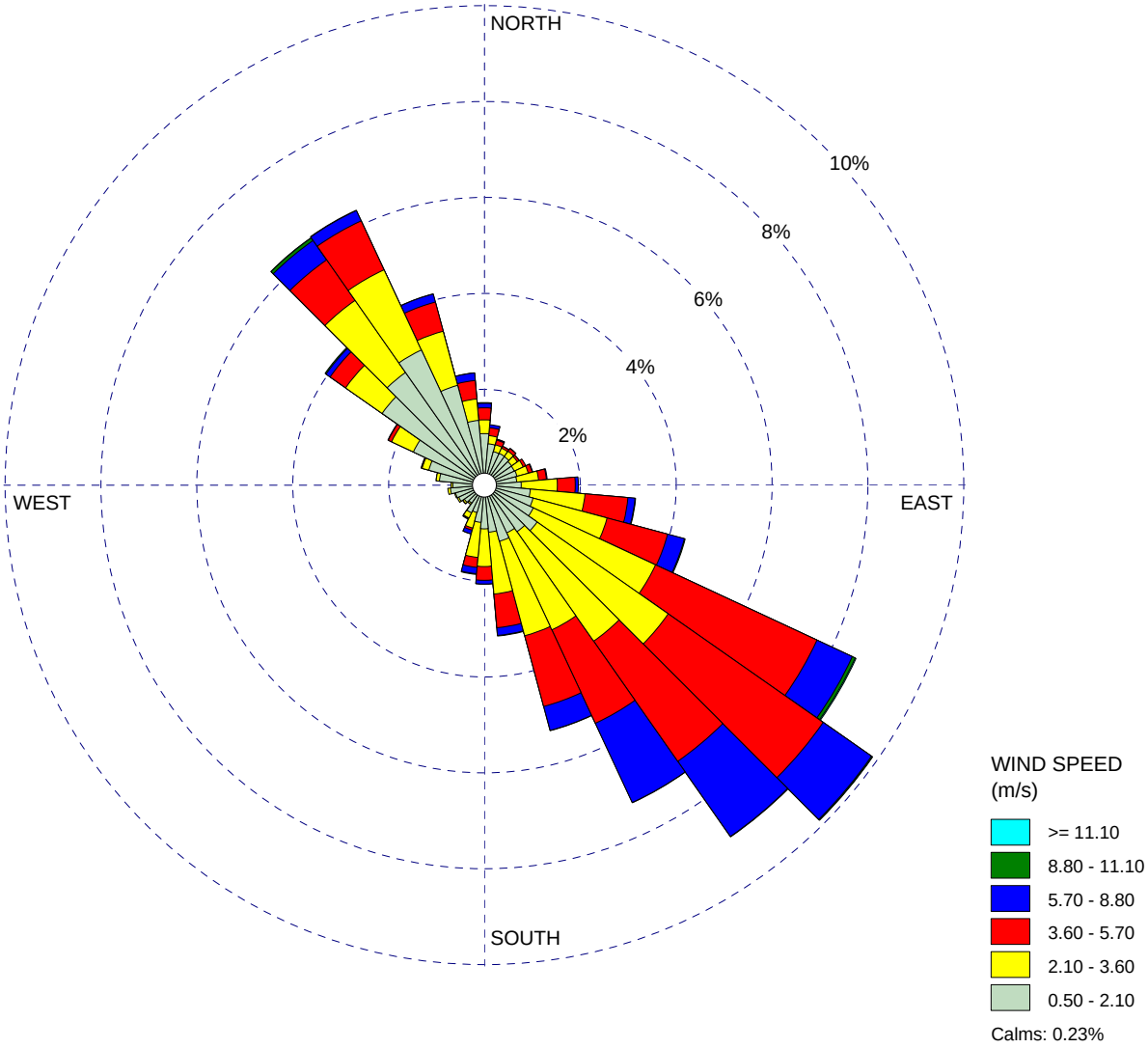
Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

WIND ROSE PLOT:

Alviso Monitoring Station
1998-2000

DISPLAY:

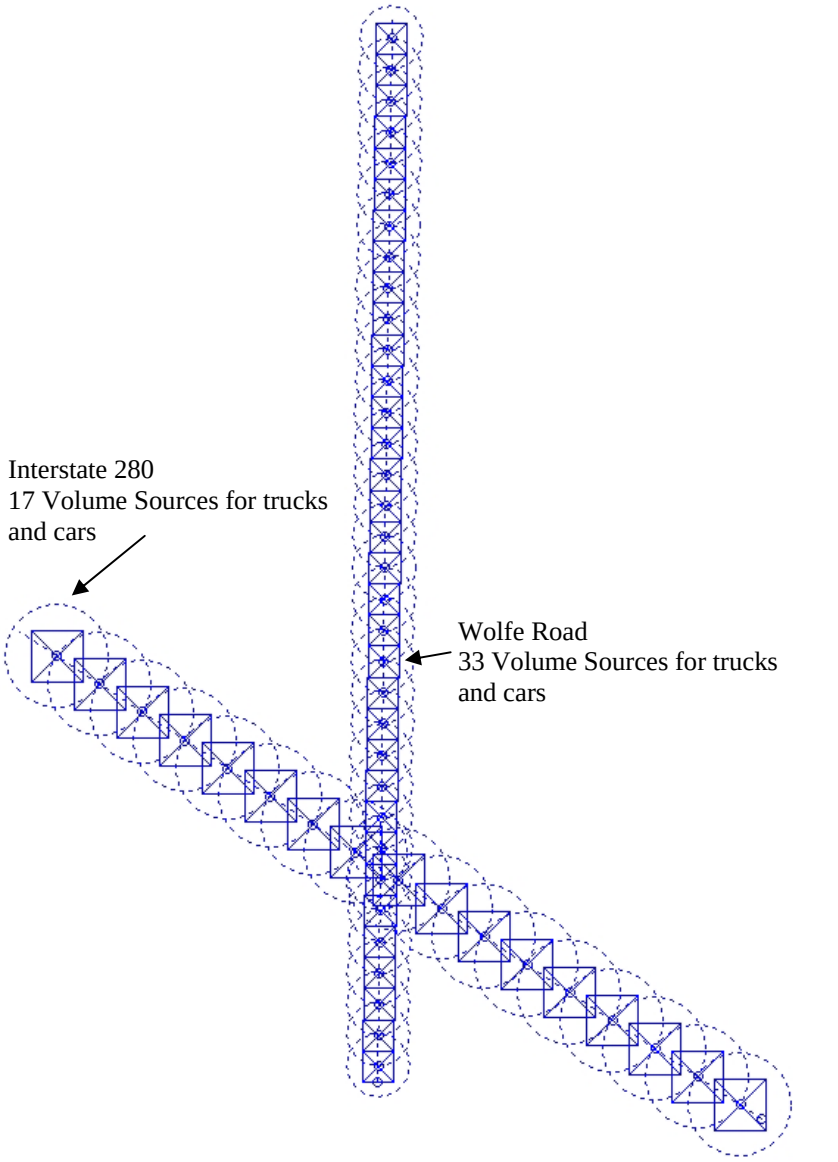
Wind Speed
Flow Vector (blowing to)



COMMENTS: Residential Hours	DATA PERIOD: **Start Date: 1/1/1998 - 00:00** **End Date: 12/31/2000 - 23:59**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.23%**	TOTAL COUNT: **26304 hrs.**	
	AVG. WIND SPEED: **3.00 m/s**	DATE: **12/18/2015**	PROJECT NO.: **COCU-06.0**

Source 1
Interstate 280 (Milepost 7.388 to 8.375)
Cars: Sources L0000001 through L0000017
Trucks: Sources L0000103through L0000119

Source 2
Wolfe Road (857 m stretch west of the Project)
Cars: Sources L0000018 through L0000051
Trucks: Sources L0000120 through L0000153



Note: Release height of 4.15 m is based upon California Air Resources Board's "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles" (2000). Release of 0.6 m used for gasoline -fueled vehicles.

Appendix

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Appendix B. ISCST3 Model Output Files

Results Summary

Hampton
Construction HRA

Concentration - Source Group: ALL

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
ANNUAL		2.45819	ug/m^3	587206.94	4132456.00	53.00	0.00	0.00	

Concentration - Source Group: PAREA1

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
ANNUAL		1.28486	ug/m^3	587206.94	4132456.00	53.00	0.00	0.00	

Concentration - Source Group: SLINE1

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
ANNUAL		1.17334	ug/m^3	587206.94	4132456.00	53.00	0.00	0.00	

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

```
 *** ISCST3 - VERSION 02035 ***    *** Hampton                                                    ***        01/05/16
                                   *** Construction HRA                                           ***        11:33:09
**MODELOPTs:                                                                                                 PAGE   1
CONC                   URBAN ELEV  FLGPOL DFAULT

                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses URBAN Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for URBAN/Non-SO2

**Model Accepts Receptors on ELEV Terrain.

**Model Accepts FLAGPOLE Receptor Heights.

**Model Calculates ANNUAL Averages Only

**This Run Includes:    20 Source(s);      3 Source Group(s); and      64 Receptor(s)

**The Model Assumes A Pollutant Type of:  OTHER

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours
```

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

```
**Misc. Inputs:  Anem. Hgt. (m) =    10.00 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     1.2 MB of RAM.

**Input Runstream File:          COCU06.INP
**Output Print File:             COCU06.OUT
**Detailed Error/Message File:   COSU06.err
```

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	EMISSION RATE SCALAR VARY BY
L0000001	0	0.52632E-01	587507.0	4132336.2	51.0	4.15	12.56	1.93	SHRDOW
L0000002	0	0.52632E-01	587486.4	4132353.8	51.0	4.15	12.56	1.93	SHRDOW
L0000003	0	0.52632E-01	587464.2	4132369.0	51.0	4.15	12.56	1.93	SHRDOW
L0000004	0	0.52632E-01	587440.3	4132381.2	51.0	4.15	12.56	1.93	SHRDOW
L0000005	0	0.52632E-01	587415.0	4132390.5	51.2	4.15	12.56	1.93	SHRDOW
L0000006	0	0.52632E-01	587388.8	4132396.8	52.0	4.15	12.56	1.93	SHRDOW
L0000007	0	0.52632E-01	587362.3	4132401.8	52.0	4.15	12.56	1.93	SHRDOW
L0000008	0	0.52632E-01	587335.4	4132402.5	52.0	4.15	12.56	1.93	SHRDOW
L0000009	0	0.52632E-01	587325.4	4132420.0	52.0	4.15	12.56	1.93	SHRDOW
L0000010	0	0.52632E-01	587325.6	4132447.0	52.0	4.15	12.56	1.93	SHRDOW
L0000011	0	0.52632E-01	587325.7	4132474.0	51.9	4.15	12.56	1.93	SHRDOW
L0000012	0	0.52632E-01	587325.8	4132501.0	51.9	4.15	12.56	1.93	SHRDOW
L0000013	0	0.52632E-01	587325.9	4132528.0	51.9	4.15	12.56	1.93	SHRDOW
L0000014	0	0.52632E-01	587326.1	4132555.0	51.3	4.15	12.56	1.93	SHRDOW
L0000015	0	0.52632E-01	587326.2	4132582.0	51.2	4.15	12.56	1.93	SHRDOW
L0000016	0	0.52632E-01	587326.3	4132609.0	51.0	4.15	12.56	1.93	SHRDOW
L0000017	0	0.52632E-01	587326.4	4132636.0	51.0	4.15	12.56	1.93	SHRDOW
L0000018	0	0.52632E-01	587326.6	4132663.0	51.0	4.15	12.56	1.93	SHRDOW
L0000019	0	0.52632E-01	587326.7	4132690.0	50.3	4.15	12.56	1.93	SHRDOW

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ (METERS)	EMISSION RATE SCALAR VARY BY
PAREA1	0	0.18857E-04	587547.1	4132174.3	51.2	4.15	17	1.93	SHRDOW

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
PAREA1	PAREA1 ,
SLINE1	L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007, L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017, L0000018, L0000019,
ALL	PAREA1 , L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007, L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017, L0000018, L0000019,

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

* SOURCE EMISSION RATE SCALARS WHICH VARY SEASONALLY, DIURNALLY AND BY DAY OF WEEK (SHRDOW) *

SOURCE ID = PAREA1 ; SOURCE TYPE = AREAPOLY :

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR
						SEASON = WINTER;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SPRING;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SUMMER;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = FALL ;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = WINTER;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SPRING;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SUMMER;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = FALL ;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = WINTER;		DAY OF WEEK = SUNDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SPRING;		DAY OF WEEK = SUNDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SUMMER;		DAY OF WEEK = SUNDAY							

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

SEASON = FALL ; DAY OF WEEK = SUNDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

* SOURCE EMISSION RATE SCALARS WHICH VARY SEASONALLY, DIURNALLY AND BY DAY OF WEEK (SHRDOW) *

SOURCE ID = L0000001 ; SOURCE TYPE = VOLUME :

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR
						SEASON = WINTER;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SPRING;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SUMMER;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = FALL ;		DAY OF WEEK = WEEKDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.1000E+01
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.0000E+00	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = WINTER;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SPRING;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SUMMER;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = FALL ;		DAY OF WEEK = SATURDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = WINTER;		DAY OF WEEK = SUNDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SPRING;		DAY OF WEEK = SUNDAY							
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
						SEASON = SUMMER;		DAY OF WEEK = SUNDAY							

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

SEASON = FALL ; DAY OF WEEK = SUNDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(587104.3,	4132586.8,	53.0,	1.5);	(587105.0,	4132569.0,	53.0,	1.5);
(587076.2,	4132550.0,	54.0,	1.5);	(587103.6,	4132551.8,	53.8,	1.5);
(587073.7,	4132536.0,	54.0,	1.5);	(587104.2,	4132533.8,	53.7,	1.5);
(587107.3,	4132513.2,	53.7,	1.5);	(587106.6,	4132497.5,	53.9,	1.5);
(587070.2,	4132515.8,	54.0,	1.5);	(587072.6,	4132494.2,	54.0,	1.5);
(587105.6,	4132475.0,	54.0,	1.5);	(587074.4,	4132473.8,	54.0,	1.5);
(587107.0,	4132453.2,	54.0,	1.5);	(587073.7,	4132454.3,	54.0,	1.5);
(587104.6,	4132437.5,	53.9,	1.5);	(587107.3,	4132417.5,	54.0,	1.5);
(587106.3,	4132399.2,	54.0,	1.5);	(587070.9,	4132436.8,	54.0,	1.5);
(587071.6,	4132414.8,	54.0,	1.5);	(587070.9,	4132400.2,	54.0,	1.5);
(587069.1,	4132381.8,	54.3,	1.5);	(587107.3,	4132380.2,	54.0,	1.5);
(587069.1,	4132362.5,	55.0,	1.5);	(587106.3,	4132362.5,	54.0,	1.5);
(587106.6,	4132345.8,	54.0,	1.5);	(587104.9,	4132324.0,	54.0,	1.5);
(587074.0,	4132324.5,	54.7,	1.5);	(587073.0,	4132343.2,	54.8,	1.5);
(587027.8,	4132329.5,	55.0,	1.5);	(587027.8,	4132349.5,	55.0,	1.5);
(587027.4,	4132370.5,	55.0,	1.5);	(587211.2,	4132343.5,	53.1,	1.5);
(587204.9,	4132307.0,	53.3,	1.5);	(587180.6,	4132282.5,	53.9,	1.5);
(587155.1,	4132317.0,	54.0,	1.5);	(587180.3,	4132362.8,	53.1,	1.5);
(587172.2,	4132235.5,	54.0,	1.5);	(587165.6,	4132193.5,	54.0,	1.5);
(587166.6,	4132213.0,	54.0,	1.5);	(587139.6,	4132212.8,	54.0,	1.5);
(587143.1,	4132191.2,	54.0,	1.5);	(587110.5,	4132251.8,	54.0,	1.5);
(587094.8,	4132251.8,	54.1,	1.5);	(587077.9,	4132251.8,	54.7,	1.5);
(587061.8,	4132251.0,	55.0,	1.5);	(587046.7,	4132250.5,	55.0,	1.5);
(587033.0,	4132249.2,	55.0,	1.5);	(587017.6,	4132250.5,	55.0,	1.5);
(587065.9,	4132271.2,	55.0,	1.5);	(587041.1,	4132274.0,	55.0,	1.5);
(587024.6,	4132275.8,	55.0,	1.5);	(587040.7,	4132123.8,	55.0,	1.5);
(587056.8,	4132113.0,	55.0,	1.5);	(587071.9,	4132102.2,	55.0,	1.5);
(587089.8,	4132086.0,	55.0,	1.5);	(587103.1,	4132072.0,	54.8,	1.5);
(587106.3,	4132046.0,	54.6,	1.5);	(587111.2,	4132020.2,	54.3,	1.5);
(587107.7,	4132000.2,	54.6,	1.5);	(587022.1,	4132134.8,	55.4,	1.5);
(587198.6,	4132413.2,	53.0,	1.5);	(587206.9,	4132456.0,	53.0,	1.5);
(587160.4,	4132455.0,	53.0,	1.5);	(587075.4,	4132569.8,	53.8,	1.5);

```
 *** ISCST3 - VERSION 02035 ***    *** Hampton                                                           ***        01/05/16
                                   *** Construction HRA                                                  ***        11:33:09
**MODELOPTs:                                                                                                        PAGE  26
CONC                    URBAN ELEV  FLGPOL DFAULT

                                                 *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                                  (1=YES; 0=NO)

                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
                          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

                              NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                       *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                                (METERS/SEC)

                                                   1.54,    3.09,    5.14,    8.23,   10.80,

                                                        *** WIND PROFILE EXPONENTS ***

                              STABILITY                                  WIND SPEED CATEGORY
                              CATEGORY         1              2              3              4              5              6
                                 A         .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
                                 B         .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
                                 C         .20000E+00     .20000E+00     .20000E+00     .20000E+00     .20000E+00     .20000E+00
                                 D         .25000E+00     .25000E+00     .25000E+00     .25000E+00     .25000E+00     .25000E+00
                                 E         .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00
                                 F         .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00

                                               *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                                           (DEGREES KELVIN PER METER)

                              STABILITY                                  WIND SPEED CATEGORY
                              CATEGORY         1              2              3              4              5              6
                                 A         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                                 B         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                                 C         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                                 D         .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
```

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: ..\Met\combined.asc
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 7905 UPPER AIR STATION NO.: 7905
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 1998 YEAR: 1998

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	MIXING HEIGHT (M) URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
98	01	01	01	152.8	1.00	281.8	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	02	325.6	1.83	282.0	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	03	303.8	1.83	281.4	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	04	321.9	1.39	280.9	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	05	177.0	1.00	280.8	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	06	208.2	1.07	280.5	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	07	297.7	1.30	280.0	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	08	16.9	1.03	279.6	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	09	264.5	1.34	280.5	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	10	320.3	2.24	281.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	11	351.2	1.74	283.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	12	58.0	1.34	285.0	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	13	253.7	1.25	286.0	1	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	14	309.3	1.61	286.9	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	15	110.7	2.37	287.1	1	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	16	154.0	2.46	285.5	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	17	170.5	1.56	285.3	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	18	246.2	1.43	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	19	314.1	2.10	285.0	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	20	313.1	2.64	284.5	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	21	319.9	4.34	285.4	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	22	315.9	3.80	284.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	23	317.7	4.52	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	24	316.8	3.35	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** THE ANNUAL (3 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: PAREA1 ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
587104.25	4132586.75	0.62621	587105.00	4132569.00	0.64225
587076.25	4132550.00	0.56395	587103.56	4132551.75	0.64720
587073.69	4132536.00	0.55465	587104.19	4132533.75	0.65389
587107.31	4132513.25	0.66438	587106.62	4132497.50	0.65598
587070.19	4132515.75	0.53638	587072.63	4132494.25	0.53054
587105.56	4132475.00	0.63630	587074.38	4132473.75	0.51910
587107.00	4132453.25	0.62101	587073.69	4132454.25	0.49735
587104.56	4132437.50	0.59197	587107.31	4132417.50	0.57699
587106.31	4132399.25	0.54674	587070.88	4132436.75	0.46903
587071.56	4132414.75	0.44547	587070.88	4132400.25	0.42616
587069.13	4132381.75	0.39924	587107.31	4132380.25	0.52207
587069.13	4132362.50	0.37640	587106.31	4132362.50	0.49005
587106.62	4132345.75	0.46359	587104.88	4132324.00	0.42193
587074.00	4132324.50	0.34245	587073.00	4132343.25	0.36278
587027.75	4132329.50	0.26372	587027.75	4132349.50	0.27946
587027.38	4132370.50	0.29610	587211.19	4132343.50	1.17429
587204.88	4132307.00	0.94032	587180.63	4132282.50	0.64748
587155.06	4132317.00	0.60947	587180.31	4132362.75	0.91539
587172.25	4132235.50	0.46819	587165.56	4132193.50	0.36111
587166.62	4132213.00	0.40013	587139.62	4132212.75	0.33219
587143.12	4132191.25	0.30808	587110.50	4132251.75	0.32718
587094.75	4132251.75	0.29735	587077.88	4132251.75	0.27005
587061.75	4132251.00	0.24697	587046.69	4132250.50	0.22835
587033.00	4132249.25	0.21282	587017.56	4132250.50	0.19887
587065.94	4132271.25	0.27091	587041.06	4132274.00	0.23940
587024.56	4132275.75	0.22159	587040.69	4132123.75	0.13953
587056.81	4132113.00	0.14300	587071.94	4132102.25	0.14653
587089.81	4132086.00	0.14973	587103.12	4132072.00	0.15177
587106.31	4132046.00	0.14135	587111.19	4132020.25	0.13404
587107.69	4132000.25	0.12532	587022.12	4132134.75	0.13540
587198.56	4132413.25	1.19388	587206.94	4132456.00	1.28486
587160.44	4132455.00	0.91178	587075.44	4132569.75	0.55953

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** THE ANNUAL (3 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: SLINE1 ***
INCLUDING SOURCE(S): L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007,
L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017, L0000018, L0000019,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
587104.25	4132586.75	0.77494	587105.00	4132569.00	0.72806
587076.25	4132550.00	0.52160	587103.56	4132551.75	0.66692
587073.69	4132536.00	0.47729	587104.19	4132533.75	0.61317
587107.31	4132513.25	0.56614	587106.62	4132497.50	0.51756
587070.19	4132515.75	0.42075	587072.63	4132494.25	0.38789
587105.56	4132475.00	0.45797	587074.38	4132473.75	0.36013
587107.00	4132453.25	0.41982	587073.69	4132454.25	0.33286
587104.56	4132437.50	0.38614	587107.31	4132417.50	0.36234
587106.31	4132399.25	0.33178	587070.88	4132436.75	0.30735
587071.56	4132414.75	0.28544	587070.88	4132400.25	0.26880
587069.13	4132381.75	0.24626	587107.31	4132380.25	0.30388
587069.13	4132362.50	0.22559	587106.31	4132362.50	0.27503
587106.62	4132345.75	0.25192	587104.88	4132324.00	0.22338
587074.00	4132324.50	0.19309	587073.00	4132343.25	0.20980
587027.75	4132329.50	0.16011	587027.75	4132349.50	0.17413
587027.38	4132370.50	0.18974	587211.19	4132343.50	0.48825
587204.88	4132307.00	0.36733	587180.63	4132282.50	0.27484
587155.06	4132317.00	0.28212	587180.31	4132362.75	0.43979
587172.25	4132235.50	0.21121	587165.56	4132193.50	0.17216
587166.62	4132213.00	0.18704	587139.62	4132212.75	0.16598
587143.12	4132191.25	0.15545	587110.50	4132251.75	0.16892
587094.75	4132251.75	0.15794	587077.88	4132251.75	0.14742
587061.75	4132251.00	0.13791	587046.69	4132250.50	0.12985
587033.00	4132249.25	0.12279	587017.56	4132250.50	0.11631
587065.94	4132271.25	0.15023	587041.06	4132274.00	0.13711
587024.56	4132275.75	0.12920	587040.69	4132123.75	0.09067
587056.81	4132113.00	0.09200	587071.94	4132102.25	0.09282
587089.81	4132086.00	0.09261	587103.12	4132072.00	0.09195
587106.31	4132046.00	0.08589	587111.19	4132020.25	0.08085
587107.69	4132000.25	0.07576	587022.12	4132134.75	0.08846
587198.56	4132413.25	0.74842	587206.94	4132456.00	1.17334
587160.44	4132455.00	0.67030	587075.44	4132569.75	0.56699

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** THE ANNUAL (3 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007, L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017, L0000018, L0000019,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
587104.25	4132586.75	1.40115	587105.00	4132569.00	1.37031
587076.25	4132550.00	1.08555	587103.56	4132551.75	1.31412
587073.69	4132536.00	1.03194	587104.19	4132533.75	1.26706
587107.31	4132513.25	1.23052	587106.62	4132497.50	1.17354
587070.19	4132515.75	0.95712	587072.63	4132494.25	0.91843
587105.56	4132475.00	1.09427	587074.38	4132473.75	0.87923
587107.00	4132453.25	1.04082	587073.69	4132454.25	0.83021
587104.56	4132437.50	0.97811	587107.31	4132417.50	0.93933
587106.31	4132399.25	0.87852	587070.88	4132436.75	0.77639
587071.56	4132414.75	0.73091	587070.88	4132400.25	0.69496
587069.13	4132381.75	0.64550	587107.31	4132380.25	0.82595
587069.13	4132362.50	0.60199	587106.31	4132362.50	0.76508
587106.62	4132345.75	0.71551	587104.88	4132324.00	0.64531
587074.00	4132324.50	0.53553	587073.00	4132343.25	0.57258
587027.75	4132329.50	0.42382	587027.75	4132349.50	0.45359
587027.38	4132370.50	0.48584	587211.19	4132343.50	1.66254
587204.88	4132307.00	1.30765	587180.63	4132282.50	0.92232
587155.06	4132317.00	0.89159	587180.31	4132362.75	1.35518
587172.25	4132235.50	0.67940	587165.56	4132193.50	0.53326
587166.62	4132213.00	0.58717	587139.62	4132212.75	0.49817
587143.12	4132191.25	0.46353	587110.50	4132251.75	0.49610
587094.75	4132251.75	0.45529	587077.88	4132251.75	0.41747
587061.75	4132251.00	0.38488	587046.69	4132250.50	0.35820
587033.00	4132249.25	0.33561	587017.56	4132250.50	0.31519
587065.94	4132271.25	0.42114	587041.06	4132274.00	0.37651
587024.56	4132275.75	0.35079	587040.69	4132123.75	0.23020
587056.81	4132113.00	0.23500	587071.94	4132102.25	0.23935
587089.81	4132086.00	0.24234	587103.12	4132072.00	0.24372
587106.31	4132046.00	0.22725	587111.19	4132020.25	0.21489
587107.69	4132000.25	0.20108	587022.12	4132134.75	0.22387
587198.56	4132413.25	1.94231	587206.94	4132456.00	2.45819
587160.44	4132455.00	1.58207	587075.44	4132569.75	1.12651

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** THE SUMMARY OF MAXIMUM ANNUAL (3 YRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
PAREA1	1ST HIGHEST VALUE IS	1.28486 AT (587206.94, 4132456.00, 53.00, 1.50)	DC	NA
	2ND HIGHEST VALUE IS	1.19388 AT (587198.56, 4132413.25, 53.00, 1.50)	DC	NA
	3RD HIGHEST VALUE IS	1.17429 AT (587211.19, 4132343.50, 53.13, 1.50)	DC	NA
	4TH HIGHEST VALUE IS	0.94032 AT (587204.88, 4132307.00, 53.25, 1.50)	DC	NA
	5TH HIGHEST VALUE IS	0.91539 AT (587180.31, 4132362.75, 53.09, 1.50)	DC	NA
	6TH HIGHEST VALUE IS	0.91178 AT (587160.44, 4132455.00, 53.00, 1.50)	DC	NA
	7TH HIGHEST VALUE IS	0.66438 AT (587107.31, 4132513.25, 53.74, 1.50)	DC	NA
	8TH HIGHEST VALUE IS	0.65598 AT (587106.62, 4132497.50, 53.94, 1.50)	DC	NA
	9TH HIGHEST VALUE IS	0.65389 AT (587104.19, 4132533.75, 53.67, 1.50)	DC	NA
	10TH HIGHEST VALUE IS	0.64748 AT (587180.63, 4132282.50, 53.94, 1.50)	DC	NA
SLINE1	1ST HIGHEST VALUE IS	1.17334 AT (587206.94, 4132456.00, 53.00, 1.50)	DC	NA
	2ND HIGHEST VALUE IS	0.77494 AT (587104.25, 4132586.75, 53.00, 1.50)	DC	NA
	3RD HIGHEST VALUE IS	0.74842 AT (587198.56, 4132413.25, 53.00, 1.50)	DC	NA
	4TH HIGHEST VALUE IS	0.72806 AT (587105.00, 4132569.00, 53.00, 1.50)	DC	NA
	5TH HIGHEST VALUE IS	0.67030 AT (587160.44, 4132455.00, 53.00, 1.50)	DC	NA
	6TH HIGHEST VALUE IS	0.66692 AT (587103.56, 4132551.75, 53.77, 1.50)	DC	NA
	7TH HIGHEST VALUE IS	0.61317 AT (587104.19, 4132533.75, 53.67, 1.50)	DC	NA
	8TH HIGHEST VALUE IS	0.56699 AT (587075.44, 4132569.75, 53.81, 1.50)	DC	NA
	9TH HIGHEST VALUE IS	0.56614 AT (587107.31, 4132513.25, 53.74, 1.50)	DC	NA
	10TH HIGHEST VALUE IS	0.52160 AT (587076.25, 4132550.00, 53.96, 1.50)	DC	NA
ALL	1ST HIGHEST VALUE IS	2.45819 AT (587206.94, 4132456.00, 53.00, 1.50)	DC	NA
	2ND HIGHEST VALUE IS	1.94231 AT (587198.56, 4132413.25, 53.00, 1.50)	DC	NA
	3RD HIGHEST VALUE IS	1.66254 AT (587211.19, 4132343.50, 53.13, 1.50)	DC	NA
	4TH HIGHEST VALUE IS	1.58207 AT (587160.44, 4132455.00, 53.00, 1.50)	DC	NA
	5TH HIGHEST VALUE IS	1.40115 AT (587104.25, 4132586.75, 53.00, 1.50)	DC	NA
	6TH HIGHEST VALUE IS	1.37031 AT (587105.00, 4132569.00, 53.00, 1.50)	DC	NA
	7TH HIGHEST VALUE IS	1.35518 AT (587180.31, 4132362.75, 53.09, 1.50)	DC	NA
	8TH HIGHEST VALUE IS	1.31412 AT (587103.56, 4132551.75, 53.77, 1.50)	DC	NA
	9TH HIGHEST VALUE IS	1.30765 AT (587204.88, 4132307.00, 53.25, 1.50)	DC	NA
	10TH HIGHEST VALUE IS	1.26706 AT (587104.19, 4132533.75, 53.67, 1.50)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

DP = DISCPOLR
BD = BOUNDARY

Model Output - Construction HRA
Unit Emission Rates (1 g/s)

CONC   URBAN ELEV FLGPOL DFAULT

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of   0 Fatal Error Message(s)
A Total of   0 Warning Message(s)
A Total of   60 Informational Message(s)

A Total of   60 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              *** NONE ***

   ********   WARNING MESSAGES   ********
              *** NONE ***

   ****
   *** ISCST3 Finishes Successfully ***
   ****

Model Output - On-site HRA
Unit Emission Rates (1 g/s)

Results Summary

Hamptons HRA
Operational Emissions

Concentration - Source Group: 1A I-280 Cars

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	98.13039	ug/m^3	587452.25	4132093.00	51.57	0.00	0.00	
PERIOD		4.40644	ug/m^3	587452.25	4132093.00	51.57	0.00	0.00	

Concentration - Source Group: 1B I-280 Trucks

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	93.09509	ug/m^3	587452.25	4132093.00	51.57	0.00	0.00	
PERIOD		3.21265	ug/m^3	587452.25	4132093.00	51.57	0.00	0.00	

Concentration - Source Group: 2A Wolfe Rd Cars

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	202.02496	ug/m^3	587372.25	4132373.00	51.73	0.00	0.00	
PERIOD		15.80013	ug/m^3	587372.25	4132373.00	51.73	0.00	0.00	

Model Output - On-site HRA
Unit Emission Rates (1 g/s)

Results Summary

Hamptons HRA
Operational Emissions

Concentration - Source Group: 2B Wolfe Rd Trucks

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	187.73102	ug/m^3	587372.25	4132293.00	52.69	0.00	0.00	
PERIOD		11.85176	ug/m^3	587372.25	4132373.00	51.73	0.00	0.00	

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

```
*** ISCST3 - VERSION 02035 ***    *** Hamptons HRA                                                    ***        12/28/15
                                   *** Operational Emissions                                           ***        14:18:06
**MODELOPTs:                                                                                                    PAGE   1
CONC                    URBAN ELEV  FLGPOL DFAULT

                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses URBAN Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for URBAN/Non-SO2

**Model Accepts Receptors on ELEV Terrain.

**Model Accepts FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR
    and Calculates PERIOD Averages

**This Run Includes:   102 Source(s);      4 Source Group(s); and     107 Receptor(s)

**The Model Assumes A Pollutant Type of:  OTHER

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
```

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

```
                                                    m for Missing Hours
                                                    b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =    10.00 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                 ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     1.3 MB of RAM.

**Input Runstream File:          HamptonsOp.INP
**Output Print File:             HamptonsOp.OUT
**Detailed Error/Message File:   HAMPTO~1.ERR
```

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	EMISSION RATE SCALAR VARY BY
L0000001	0	0.58824E-01	587607.1	4131820.0	54.1	0.60	19.07	2.93	HROFDY
L0000002	0	0.58824E-01	587572.9	4131842.5	53.8	0.60	19.07	2.93	HROFDY
L0000003	0	0.58824E-01	587538.6	4131865.0	53.8	0.60	19.07	2.93	HROFDY
L0000004	0	0.58824E-01	587504.3	4131887.5	53.7	0.60	19.07	2.93	HROFDY
L0000005	0	0.58824E-01	587470.1	4131910.0	53.4	0.60	19.07	2.93	HROFDY
L0000006	0	0.58824E-01	587435.8	4131932.5	53.6	0.60	19.07	2.93	HROFDY
L0000007	0	0.58824E-01	587401.5	4131955.0	53.7	0.60	19.07	2.93	HROFDY
L0000008	0	0.58824E-01	587367.2	4131977.5	53.8	0.60	19.07	2.93	HROFDY
L0000009	0	0.58824E-01	587332.9	4132000.0	53.6	0.60	19.07	2.93	HROFDY
L0000010	0	0.58824E-01	587298.7	4132022.5	53.9	0.60	19.07	2.93	HROFDY
L0000011	0	0.58824E-01	587264.4	4132045.0	54.0	0.60	19.07	2.93	HROFDY
L0000012	0	0.58824E-01	587230.1	4132067.5	54.4	0.60	19.07	2.93	HROFDY
L0000013	0	0.58824E-01	587195.8	4132090.0	54.8	0.60	19.07	2.93	HROFDY
L0000014	0	0.58824E-01	587161.6	4132112.5	55.0	0.60	19.07	2.93	HROFDY
L0000015	0	0.58824E-01	587127.3	4132135.0	55.5	0.60	19.07	2.93	HROFDY
L0000016	0	0.58824E-01	587093.0	4132157.5	55.9	0.60	19.07	2.93	HROFDY
L0000017	0	0.58824E-01	587058.8	4132180.0	56.4	0.60	19.07	2.93	HROFDY
L0000018	0	0.29412E-01	587316.6	4131850.5	55.4	0.60	11.63	2.59	HROFDY
L0000019	0	0.29412E-01	587316.9	4131875.5	56.5	0.60	11.63	2.59	HROFDY
L0000020	0	0.29412E-01	587317.2	4131900.5	58.0	0.60	11.63	2.59	HROFDY
L0000021	0	0.29412E-01	587317.6	4131925.5	59.1	0.60	11.63	2.59	HROFDY
L0000022	0	0.29412E-01	587317.9	4131950.5	59.9	0.60	11.63	2.59	HROFDY
L0000023	0	0.29412E-01	587318.2	4131975.5	53.8	0.60	11.63	2.59	HROFDY
L0000024	0	0.29412E-01	587318.5	4132000.5	53.9	0.60	11.63	2.59	HROFDY
L0000025	0	0.29412E-01	587318.8	4132025.5	53.5	0.60	11.63	2.59	HROFDY
L0000026	0	0.29412E-01	587319.1	4132050.5	57.2	0.60	11.63	2.59	HROFDY
L0000027	0	0.29412E-01	587319.5	4132075.5	59.4	0.60	11.63	2.59	HROFDY
L0000028	0	0.29412E-01	587319.8	4132100.5	57.9	0.60	11.63	2.59	HROFDY
L0000029	0	0.29412E-01	587320.1	4132125.5	56.8	0.60	11.63	2.59	HROFDY
L0000030	0	0.29412E-01	587320.4	4132150.5	55.2	0.60	11.63	2.59	HROFDY
L0000031	0	0.29412E-01	587320.8	4132175.5	54.3	0.60	11.63	2.59	HROFDY
L0000032	0	0.29412E-01	587321.1	4132200.5	53.6	0.60	11.63	2.59	HROFDY
L0000033	0	0.29412E-01	587321.4	4132225.5	53.2	0.60	11.63	2.59	HROFDY
L0000034	0	0.29412E-01	587321.8	4132250.5	53.2	0.60	11.63	2.59	HROFDY
L0000035	0	0.29412E-01	587322.1	4132275.5	53.1	0.60	11.63	2.59	HROFDY
L0000036	0	0.29412E-01	587322.4	4132300.5	52.8	0.60	11.63	2.59	HROFDY
L0000037	0	0.29412E-01	587322.7	4132325.5	52.5	0.60	11.63	2.59	HROFDY

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

L0000038	0	0.29412E-01	587323.1	4132350.5	52.1	0.60	11.63	2.59	HROFDY
L0000039	0	0.29412E-01	587323.4	4132375.5	51.8	0.60	11.63	2.59	HROFDY
L0000040	0	0.29412E-01	587323.7	4132400.5	51.6	0.60	11.63	2.59	HROFDY
L0000041	0	0.29412E-01	587324.0	4132425.5	51.5	0.60	11.63	2.59	HROFDY
L0000042	0	0.29412E-01	587324.3	4132450.5	51.3	0.60	11.63	2.59	HROFDY
L0000043	0	0.29412E-01	587324.6	4132475.5	51.1	0.60	11.63	2.59	HROFDY
L0000044	0	0.29412E-01	587325.0	4132500.5	51.0	0.60	11.63	2.59	HROFDY
L0000045	0	0.29412E-01	587325.3	4132525.5	51.1	0.60	11.63	2.59	HROFDY
L0000046	0	0.29412E-01	587325.6	4132550.5	51.2	0.60	11.63	2.59	HROFDY
L0000047	0	0.29412E-01	587325.9	4132575.5	51.5	0.60	11.63	2.59	HROFDY
L0000048	0	0.29412E-01	587326.2	4132600.5	51.7	0.60	11.63	2.59	HROFDY
L0000049	0	0.29412E-01	587326.6	4132625.5	52.1	0.60	11.63	2.59	HROFDY
L0000050	0	0.29412E-01	587326.9	4132650.5	52.4	0.60	11.63	2.59	HROFDY
L0000051	0	0.29412E-01	587327.2	4132675.5	52.1	0.60	11.63	2.59	HROFDY
L0000103	0	0.58824E-01	587607.1	4131820.0	54.1	4.15	19.07	2.93	HROFDY
L0000104	0	0.58824E-01	587572.9	4131842.5	53.8	4.15	19.07	2.93	HROFDY
L0000105	0	0.58824E-01	587538.6	4131865.0	53.8	4.15	19.07	2.93	HROFDY
L0000106	0	0.58824E-01	587504.3	4131887.5	53.7	4.15	19.07	2.93	HROFDY
L0000107	0	0.58824E-01	587470.1	4131910.0	53.4	4.15	19.07	2.93	HROFDY
L0000108	0	0.58824E-01	587435.8	4131932.5	53.6	4.15	19.07	2.93	HROFDY
L0000109	0	0.58824E-01	587401.5	4131955.0	53.7	4.15	19.07	2.93	HROFDY
L0000110	0	0.58824E-01	587367.2	4131977.5	53.8	4.15	19.07	2.93	HROFDY
L0000111	0	0.58824E-01	587332.9	4132000.0	53.6	4.15	19.07	2.93	HROFDY
L0000112	0	0.58824E-01	587298.7	4132022.5	53.9	4.15	19.07	2.93	HROFDY
L0000113	0	0.58824E-01	587264.4	4132045.0	54.0	4.15	19.07	2.93	HROFDY
L0000114	0	0.58824E-01	587230.1	4132067.5	54.4	4.15	19.07	2.93	HROFDY
L0000115	0	0.58824E-01	587195.8	4132090.0	54.8	4.15	19.07	2.93	HROFDY
L0000116	0	0.58824E-01	587161.6	4132112.5	55.0	4.15	19.07	2.93	HROFDY
L0000117	0	0.58824E-01	587127.3	4132135.0	55.5	4.15	19.07	2.93	HROFDY
L0000118	0	0.58824E-01	587093.0	4132157.5	55.9	4.15	19.07	2.93	HROFDY
L0000119	0	0.58824E-01	587058.8	4132180.0	56.4	4.15	19.07	2.93	HROFDY
L0000120	0	0.29412E-01	587316.6	4131850.5	55.4	4.15	11.63	2.59	HROFDY
L0000121	0	0.29412E-01	587316.9	4131875.5	56.5	4.15	11.63	2.59	HROFDY
L0000122	0	0.29412E-01	587317.2	4131900.5	58.0	4.15	11.63	2.59	HROFDY
L0000123	0	0.29412E-01	587317.6	4131925.5	59.1	4.15	11.63	2.59	HROFDY
L0000124	0	0.29412E-01	587317.9	4131950.5	59.9	4.15	11.63	2.59	HROFDY
L0000125	0	0.29412E-01	587318.2	4131975.5	53.8	4.15	11.63	2.59	HROFDY
L0000126	0	0.29412E-01	587318.5	4132000.5	53.9	4.15	11.63	2.59	HROFDY
L0000127	0	0.29412E-01	587318.8	4132025.5	53.5	4.15	11.63	2.59	HROFDY
L0000128	0	0.29412E-01	587319.1	4132050.5	57.2	4.15	11.63	2.59	HROFDY
L0000129	0	0.29412E-01	587319.5	4132075.5	59.4	4.15	11.63	2.59	HROFDY
L0000130	0	0.29412E-01	587319.8	4132100.5	57.9	4.15	11.63	2.59	HROFDY
L0000131	0	0.29412E-01	587320.1	4132125.5	56.8	4.15	11.63	2.59	HROFDY

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	EMISSION RATE SCALAR VARY BY
L0000132	0	0.29412E-01	587320.4	4132150.5	55.2	4.15	11.63	2.59	HROFDY
L0000133	0	0.29412E-01	587320.8	4132175.5	54.3	4.15	11.63	2.59	HROFDY
L0000134	0	0.29412E-01	587321.1	4132200.5	53.6	4.15	11.63	2.59	HROFDY
L0000135	0	0.29412E-01	587321.4	4132225.5	53.2	4.15	11.63	2.59	HROFDY
L0000136	0	0.29412E-01	587321.8	4132250.5	53.2	4.15	11.63	2.59	HROFDY
L0000137	0	0.29412E-01	587322.1	4132275.5	53.1	4.15	11.63	2.59	HROFDY
L0000138	0	0.29412E-01	587322.4	4132300.5	52.8	4.15	11.63	2.59	HROFDY
L0000139	0	0.29412E-01	587322.7	4132325.5	52.5	4.15	11.63	2.59	HROFDY
L0000140	0	0.29412E-01	587323.1	4132350.5	52.1	4.15	11.63	2.59	HROFDY
L0000141	0	0.29412E-01	587323.4	4132375.5	51.8	4.15	11.63	2.59	HROFDY
L0000142	0	0.29412E-01	587323.7	4132400.5	51.6	4.15	11.63	2.59	HROFDY
L0000143	0	0.29412E-01	587324.0	4132425.5	51.5	4.15	11.63	2.59	HROFDY
L0000144	0	0.29412E-01	587324.3	4132450.5	51.3	4.15	11.63	2.59	HROFDY
L0000145	0	0.29412E-01	587324.6	4132475.5	51.1	4.15	11.63	2.59	HROFDY
L0000146	0	0.29412E-01	587325.0	4132500.5	51.0	4.15	11.63	2.59	HROFDY
L0000147	0	0.29412E-01	587325.3	4132525.5	51.1	4.15	11.63	2.59	HROFDY
L0000148	0	0.29412E-01	587325.6	4132550.5	51.2	4.15	11.63	2.59	HROFDY
L0000149	0	0.29412E-01	587325.9	4132575.5	51.5	4.15	11.63	2.59	HROFDY
L0000150	0	0.29412E-01	587326.2	4132600.5	51.7	4.15	11.63	2.59	HROFDY
L0000151	0	0.29412E-01	587326.6	4132625.5	52.1	4.15	11.63	2.59	HROFDY
L0000152	0	0.29412E-01	587326.9	4132650.5	52.4	4.15	11.63	2.59	HROFDY
L0000153	0	0.29412E-01	587327.2	4132675.5	52.1	4.15	11.63	2.59	HROFDY

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
1A	L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007, L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017,
1B	L0000103, L0000104, L0000105, L0000106, L0000107, L0000108, L0000109, L0000110, L0000111, L0000112, L0000113, L0000114, L0000115, L0000116, L0000117, L0000118, L0000119,
2A	L0000018, L0000019, L0000020, L0000021, L0000022, L0000023, L0000024, L0000025, L0000026, L0000027, L0000028, L0000029, L0000030, L0000031, L0000032, L0000033, L0000034, L0000035, L0000036, L0000037, L0000038, L0000039, L0000040, L0000041, L0000042, L0000043, L0000044, L0000045, L0000046, L0000047, L0000048, L0000049, L0000050, L0000051,
2B	L0000120, L0000121, L0000122, L0000123, L0000124, L0000125, L0000126, L0000127, L0000128, L0000129, L0000130, L0000131, L0000132, L0000133, L0000134, L0000135, L0000136, L0000137, L0000138, L0000139, L0000140, L0000141, L0000142, L0000143, L0000144, L0000145, L0000146, L0000147, L0000148, L0000149, L0000150, L0000151, L0000152, L0000153,

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

* SOURCE EMISSION RATE SCALARS WHICH VARY FOR EACH HOUR OF THE DAY *

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR

SOURCE ID = L0000001 through L0000051 ; SOURCE TYPE = VOLUME :

1	.11700E+00	2	.69000E-01	3	.55000E-01	4	.50000E-01	5	.87000E-01	6	.26700E+00
7	.61500E+00	8	.91500E+00	9	.93900E+00	10	.99700E+00	11	.90100E+00	12	.80700E+00
13	.80200E+00	14	.81600E+00	15	.92000E+00	16	.96900E+00	17	.98500E+00	18	.10000E+01
19	.91400E+00	20	.75200E+00	21	.53400E+00	22	.44200E+00	23	.33400E+00	24	.20200E+00

SOURCE ID = L0000103 through L0000153 ; SOURCE TYPE = VOLUME :

1	.97000E-01	2	.59000E-01	3	.42000E-01	4	.38000E-01	5	.70000E-01	6	.19900E+00
7	.39300E+00	8	.63700E+00	9	.80600E+00	10	.82200E+00	11	.68100E+00	12	.63000E+00
13	.63500E+00	14	.64200E+00	15	.68900E+00	16	.96700E+00	17	.99300E+00	18	.10000E+01
19	.89400E+00	20	.65000E+00	21	.33100E+00	22	.25500E+00	23	.17100E+00	24	.11700E+00

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(587452.2,	4132093.0,	51.6,	1.5);	(587472.3,	4132093.0,	51.8,	1.5);
(587452.2,	4132113.0,	51.9,	1.5);	(587472.3,	4132113.0,	52.0,	1.5);
(587492.2,	4132113.0,	52.3,	1.5);	(587512.2,	4132113.0,	51.8,	1.5);
(587432.2,	4132133.0,	52.2,	1.5);	(587452.2,	4132133.0,	52.4,	1.5);
(587472.3,	4132133.0,	52.4,	1.5);	(587492.2,	4132133.0,	52.3,	1.5);
(587512.2,	4132133.0,	52.3,	1.5);	(587532.3,	4132133.0,	51.8,	1.5);
(587412.2,	4132153.0,	52.3,	1.5);	(587432.2,	4132153.0,	52.6,	1.5);
(587452.2,	4132153.0,	52.3,	1.5);	(587472.3,	4132153.0,	52.4,	1.5);
(587492.2,	4132153.0,	52.4,	1.5);	(587512.2,	4132153.0,	52.3,	1.5);
(587532.3,	4132153.0,	52.3,	1.5);	(587552.2,	4132153.0,	51.6,	1.5);
(587392.2,	4132173.0,	52.4,	1.5);	(587412.2,	4132173.0,	52.7,	1.5);
(587432.2,	4132173.0,	52.5,	1.5);	(587452.2,	4132173.0,	52.2,	1.5);
(587472.3,	4132173.0,	52.1,	1.5);	(587492.2,	4132173.0,	53.3,	1.5);
(587512.2,	4132173.0,	52.8,	1.5);	(587532.3,	4132173.0,	52.0,	1.5);
(587552.2,	4132173.0,	51.6,	1.5);	(587372.2,	4132193.0,	52.5,	1.5);
(587392.2,	4132193.0,	52.7,	1.5);	(587412.2,	4132193.0,	52.5,	1.5);
(587432.2,	4132193.0,	52.2,	1.5);	(587452.2,	4132193.0,	52.1,	1.5);
(587472.3,	4132193.0,	51.8,	1.5);	(587492.2,	4132193.0,	52.5,	1.5);
(587512.2,	4132193.0,	52.9,	1.5);	(587532.3,	4132193.0,	51.8,	1.5);
(587552.2,	4132193.0,	51.4,	1.5);	(587372.2,	4132213.0,	52.7,	1.5);
(587392.2,	4132213.0,	52.9,	1.5);	(587412.2,	4132213.0,	52.5,	1.5);
(587432.2,	4132213.0,	52.2,	1.5);	(587452.2,	4132213.0,	52.3,	1.5);
(587472.3,	4132213.0,	51.8,	1.5);	(587492.2,	4132213.0,	51.4,	1.5);
(587512.2,	4132213.0,	52.5,	1.5);	(587532.3,	4132213.0,	51.4,	1.5);
(587552.2,	4132213.0,	51.3,	1.5);	(587372.2,	4132233.0,	52.8,	1.5);
(587392.2,	4132233.0,	52.7,	1.5);	(587412.2,	4132233.0,	52.2,	1.5);
(587432.2,	4132233.0,	52.1,	1.5);	(587452.2,	4132233.0,	52.3,	1.5);
(587472.3,	4132233.0,	52.8,	1.5);	(587492.2,	4132233.0,	51.6,	1.5);
(587512.2,	4132233.0,	51.2,	1.5);	(587532.3,	4132233.0,	51.3,	1.5);
(587552.2,	4132233.0,	51.2,	1.5);	(587372.2,	4132253.0,	52.7,	1.5);
(587392.2,	4132253.0,	52.2,	1.5);	(587412.2,	4132253.0,	52.6,	1.5);
(587432.2,	4132253.0,	53.3,	1.5);	(587452.2,	4132253.0,	53.5,	1.5);
(587472.3,	4132253.0,	52.8,	1.5);	(587492.2,	4132253.0,	51.8,	1.5);
(587512.2,	4132253.0,	51.1,	1.5);	(587532.3,	4132253.0,	51.3,	1.5);
(587552.2,	4132253.0,	50.9,	1.5);	(587372.2,	4132273.0,	52.7,	1.5);
(587392.2,	4132273.0,	53.5,	1.5);	(587412.2,	4132273.0,	52.4,	1.5);
(587432.2,	4132273.0,	53.0,	1.5);	(587452.2,	4132273.0,	53.3,	1.5);
(587472.3,	4132273.0,	52.5,	1.5);	(587492.2,	4132273.0,	51.3,	1.5);
(587512.2,	4132273.0,	51.3,	1.5);	(587532.3,	4132273.0,	51.3,	1.5);
(587372.2,	4132293.0,	52.7,	1.5);	(587392.2,	4132293.0,	53.2,	1.5);

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

```
( 587412.2, 4132293.0,      53.0,       1.5);
( 587452.2, 4132293.0,      51.8,       1.5);
( 587492.2, 4132293.0,      51.2,       1.5);
( 587372.2, 4132313.0,      52.1,       1.5);
( 587412.2, 4132313.0,      52.0,       1.5);
( 587452.2, 4132313.0,      51.3,       1.5);
( 587492.2, 4132313.0,      51.3,       1.5);
( 587392.2, 4132333.0,      51.7,       1.5);
( 587432.2, 4132333.0,      51.3,       1.5);
( 587472.3, 4132333.0,      51.2,       1.5);
( 587392.2, 4132353.0,      51.8,       1.5);
( 587432.2, 4132353.0,      51.3,       1.5);
( 587372.2, 4132373.0,      51.7,       1.5);
( 587412.2, 4132373.0,      51.7,       1.5);
( 587432.2, 4132293.0,      52.2,       1.5);
( 587472.3, 4132293.0,      51.7,       1.5);
( 587512.2, 4132293.0,      51.2,       1.5);
( 587392.2, 4132313.0,      51.7,       1.5);
( 587432.2, 4132313.0,      51.5,       1.5);
( 587472.3, 4132313.0,      51.4,       1.5);
( 587372.2, 4132333.0,      52.1,       1.5);
( 587412.2, 4132333.0,      51.3,       1.5);
( 587452.2, 4132333.0,      51.2,       1.5);
( 587372.2, 4132353.0,      51.8,       1.5);
( 587412.2, 4132353.0,      51.8,       1.5);
( 587452.2, 4132353.0,      51.5,       1.5);
( 587392.2, 4132373.0,      51.8,       1.5);
```

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

```
 *** ISCST3 - VERSION 02035 ***    *** Hamptons HRA                                                         ***        12/28/15
                                   *** Operational Emissions                                                ***        14:18:06
**MODELOPTs:                                                                                                           PAGE  29
CONC                    URBAN ELEV  FLGPOL DFAULT

                                           *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                              (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                 *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                           (METERS/SEC)

                                                1.54,   3.09,   5.14,   8.23,  10.80,


                                                  *** WIND PROFILE EXPONENTS ***


               STABILITY                             WIND SPEED CATEGORY
               CATEGORY         1              2              3              4              5              6
                  A          .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
                  B          .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
                  C          .20000E+00     .20000E+00     .20000E+00     .20000E+00     .20000E+00     .20000E+00
                  D          .25000E+00     .25000E+00     .25000E+00     .25000E+00     .25000E+00     .25000E+00
                  E          .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00
                  F          .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00     .30000E+00


                                         *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                                    (DEGREES KELVIN PER METER)


               STABILITY                             WIND SPEED CATEGORY
               CATEGORY         1              2              3              4              5              6
                  A          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                  B          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                  C          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                  D          .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00     .00000E+00
                  E          .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01     .20000E-01
                  F          .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01     .35000E-01
```

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\!METFI~1\BAAQMD~1\ALV199~1.ASC
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 7905 UPPER AIR STATION NO.: 7905
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 1998 YEAR: 1998

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	MIXING HEIGHT (M) URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
98	01	01	01	152.8	1.00	281.8	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	02	325.6	1.83	282.0	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	03	303.8	1.83	281.4	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	04	321.9	1.39	280.9	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	05	177.0	1.00	280.8	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	06	208.2	1.07	280.5	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	07	297.7	1.30	280.0	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	08	16.9	1.03	279.6	6	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	09	264.5	1.34	280.5	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	10	320.3	2.24	281.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	11	351.2	1.74	283.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	12	58.0	1.34	285.0	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	13	253.7	1.25	286.0	1	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	14	309.3	1.61	286.9	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	15	110.7	2.37	287.1	1	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	16	154.0	2.46	285.5	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	17	170.5	1.56	285.3	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	18	246.2	1.43	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	19	314.1	2.10	285.0	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	20	313.1	2.64	284.5	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	21	319.9	4.34	285.4	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	22	315.9	3.80	284.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	23	317.7	4.52	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
98	01	01	24	316.8	3.35	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (26304 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
1A	1ST HIGHEST VALUE IS	4.40644	AT (	587452.25,	4132093.00,	51.57,	1.50)	DC	NA
	2ND HIGHEST VALUE IS	3.89416	AT (	587472.25,	4132093.00,	51.81,	1.50)	DC	NA
	3RD HIGHEST VALUE IS	3.76119	AT (	587452.25,	4132113.00,	51.87,	1.50)	DC	NA
	4TH HIGHEST VALUE IS	3.62858	AT (	587432.25,	4132133.00,	52.17,	1.50)	DC	NA
	5TH HIGHEST VALUE IS	3.48955	AT (	587412.25,	4132153.00,	52.34,	1.50)	DC	NA
	6TH HIGHEST VALUE IS	3.34843	AT (	587472.25,	4132113.00,	52.03,	1.50)	DC	NA
	7TH HIGHEST VALUE IS	3.34796	AT (	587392.25,	4132173.00,	52.44,	1.50)	DC	NA
	8TH HIGHEST VALUE IS	3.25138	AT (	587452.25,	4132133.00,	52.41,	1.50)	DC	NA
	9TH HIGHEST VALUE IS	3.20561	AT (	587372.25,	4132193.00,	52.45,	1.50)	DC	NA
	10TH HIGHEST VALUE IS	3.14566	AT (	587432.25,	4132153.00,	52.60,	1.50)	DC	NA
1B	1ST HIGHEST VALUE IS	3.21265	AT (	587452.25,	4132093.00,	51.57,	1.50)	DC	NA
	2ND HIGHEST VALUE IS	2.85530	AT (	587472.25,	4132093.00,	51.81,	1.50)	DC	NA
	3RD HIGHEST VALUE IS	2.75500	AT (	587452.25,	4132113.00,	51.87,	1.50)	DC	NA
	4TH HIGHEST VALUE IS	2.65962	AT (	587432.25,	4132133.00,	52.17,	1.50)	DC	NA
	5TH HIGHEST VALUE IS	2.55666	AT (	587412.25,	4132153.00,	52.34,	1.50)	DC	NA
	6TH HIGHEST VALUE IS	2.46343	AT (	587472.25,	4132113.00,	52.03,	1.50)	DC	NA
	7TH HIGHEST VALUE IS	2.45067	AT (	587392.25,	4132173.00,	52.44,	1.50)	DC	NA
	8TH HIGHEST VALUE IS	2.39423	AT (	587452.25,	4132133.00,	52.41,	1.50)	DC	NA
	9TH HIGHEST VALUE IS	2.34309	AT (	587372.25,	4132193.00,	52.45,	1.50)	DC	NA
	10TH HIGHEST VALUE IS	2.31520	AT (	587432.25,	4132153.00,	52.60,	1.50)	DC	NA
2A	1ST HIGHEST VALUE IS	15.80013	AT (	587372.25,	4132373.00,	51.73,	1.50)	DC	NA
	2ND HIGHEST VALUE IS	15.76782	AT (	587372.25,	4132353.00,	51.83,	1.50)	DC	NA
	3RD HIGHEST VALUE IS	15.72726	AT (	587372.25,	4132333.00,	52.06,	1.50)	DC	NA
	4TH HIGHEST VALUE IS	15.64483	AT (	587372.25,	4132313.00,	52.11,	1.50)	DC	NA
	5TH HIGHEST VALUE IS	15.62936	AT (	587372.25,	4132293.00,	52.69,	1.50)	DC	NA
	6TH HIGHEST VALUE IS	15.55406	AT (	587372.25,	4132273.00,	52.67,	1.50)	DC	NA
	7TH HIGHEST VALUE IS	15.47531	AT (	587372.25,	4132253.00,	52.65,	1.50)	DC	NA
	8TH HIGHEST VALUE IS	15.40742	AT (	587372.25,	4132233.00,	52.83,	1.50)	DC	NA
	9TH HIGHEST VALUE IS	15.26857	AT (	587372.25,	4132213.00,	52.74,	1.50)	DC	NA
	10TH HIGHEST VALUE IS	15.05838	AT (	587372.25,	4132193.00,	52.45,	1.50)	DC	NA

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (26304 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
2B	1ST HIGHEST VALUE IS	11.85176 AT (587372.25, 4132373.00, 51.73, 1.50)	DC	NA
	2ND HIGHEST VALUE IS	11.80630 AT (587372.25, 4132353.00, 51.83, 1.50)	DC	NA
	3RD HIGHEST VALUE IS	11.78922 AT (587372.25, 4132333.00, 52.06, 1.50)	DC	NA
	4TH HIGHEST VALUE IS	11.78301 AT (587372.25, 4132293.00, 52.69, 1.50)	DC	NA
	5TH HIGHEST VALUE IS	11.67421 AT (587372.25, 4132313.00, 52.11, 1.50)	DC	NA
	6TH HIGHEST VALUE IS	11.65391 AT (587372.25, 4132273.00, 52.67, 1.50)	DC	NA
	7TH HIGHEST VALUE IS	11.53134 AT (587372.25, 4132253.00, 52.65, 1.50)	DC	NA
	8TH HIGHEST VALUE IS	11.48697 AT (587372.25, 4132233.00, 52.83, 1.50)	DC	NA
	9TH HIGHEST VALUE IS	11.30420 AT (587372.25, 4132213.00, 52.74, 1.50)	DC	NA
	10TH HIGHEST VALUE IS	11.00138 AT (587372.25, 4132193.00, 52.45, 1.50)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

Model Input - On-site HRA
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
1A	HIGH 1ST HIGH VALUE IS	98.13039	ON 99102018:	AT (587452.25, 4132093.00, 51.57, 1.50)	DC	NA
1B	HIGH 1ST HIGH VALUE IS	93.09509	ON 99102018:	AT (587452.25, 4132093.00, 51.57, 1.50)	DC	NA
2A	HIGH 1ST HIGH VALUE IS	202.02496	ON 99102118:	AT (587372.25, 4132373.00, 51.73, 1.50)	DC	NA
2B	HIGH 1ST HIGH VALUE IS	187.73102	ON 98112218:	AT (587372.25, 4132293.00, 52.69, 1.50)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

```
 *** ISCST3 - VERSION 02035 ***    *** Hamptons HRA                                                    ***        12/28/15
                                   *** Operational Emissions                                           ***        14:18:06
**MODELOPTs:                                                                                                     PAGE  50
CONC                    URBAN ELEV  FLGPOL DFAULT


*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of            1 Warning Message(s)
A Total of           60 Informational Message(s)

A Total of           60 Calm Hours Identified


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
RE W282   859 CHK_EL:RecElev < SrcBase; See non-DFAULT HE>ZI option in  MCB#9

   *********************************
   *** ISCST3 Finishes Successfully ***
   *********************************
```

Appendix C. Construction Risk Calculation Worksheets

Table C1
MER Concentrations

Residential Receptors - Unmitigated				
Emission Source (a)	ISCST3 Output [1] ($\mu g/m^3$) (b)	Pollutant (c)	Emission Rates [2] (g/s) (d)	MER Concentrations ($\mu g/m^3$) (f)
	Annual Average		Average Daily	Annual Average
2017 Onsite	1.28	DPM	6.00E-02	**7.71E-02**
		$PM_{2.5}$	7.21E-02	**9.26E-02**
2017 Offsite	1.17	DPM	1.69E-04	**1.99E-04**
		$PM_{2.5}$	5.28E-04	**6.19E-04**
2018 Onsite	1.28	DPM	3.06E-02	**3.93E-02**
		$PM_{2.5}$	2.87E-02	**3.69E-02**
2018 Offsite	1.17	DPM	1.15E-04	**1.35E-04**
		$PM_{2.5}$	1.03E-03	**1.21E-03**
2019 Onsite	1.28	DPM	1.93E-02	**2.47E-02**
		$PM_{2.5}$	1.81E-02	**2.33E-02**
2019 Offsite	1.17	DPM	7.39E-05	**8.67E-05**
		$PM_{2.5}$	6.99E-04	**8.20E-04**
2020 Onsite	1.28	DPM	1.82E-02	**2.33E-02**
		$PM_{2.5}$	1.71E-02	**2.20E-02**
2020 Offsite	1.17	DPM	6.81E-05	**7.99E-05**
		$PM_{2.5}$	7.07E-04	**8.30E-04**
Residential Receptors - Mitigation: Tier 3 Engines for equipment > 50 HP				
Source (a)	ISCST3 Output [1] ($\mu g/m^3$) (c)	Pollutant (b)	Emission Rates [2] (g/s) (d)	Mass GLC ($\mu g/m^3$) (f)
	Annual Average		Average Daily	Annual Average
2017 Onsite	1.28	DPM	2.53E-02	**3.24E-02**
		$PM_{2.5}$	4.17E-02	**5.36E-02**
2017 Offsite	1.17	DPM	1.69E-04	**1.99E-04**
		$PM_{2.5}$	5.28E-04	**6.19E-04**
2018 Onsite	1.28	DPM	1.96E-02	**2.51E-02**
		$PM_{2.5}$	1.96E-02	**2.51E-02**
2018 Offsite	1.17	DPM	1.15E-04	**1.35E-04**
		$PM_{2.5}$	1.03E-03	**1.21E-03**
2019 Onsite	1.28	DPM	1.38E-02	**1.77E-02**
		$PM_{2.5}$	1.38E-02	**1.77E-02**
2019 Offsite	1.17	DPM	7.39E-05	**8.67E-05**
		$PM_{2.5}$	6.99E-04	**8.20E-04**
2020 Onsite	1.28	DPM	1.48E-02	**1.90E-02**
		$PM_{2.5}$	1.48E-02	**1.90E-02**
2020 Offsite	1.17	DPM	6.81E-05	**7.99E-05**
		$PM_{2.5}$	7.07E-04	**8.30E-04**

MER UTM coordinates: 587206.94E, 4132456.00N

[1] ISCST3 Output at the MER for Onsite emissions based on unit emission rates for sources (1 g/s).

[2] Emission Rates from Emission Rate Calculations (Appendix A - Construction Emissions).

Table C2
Quantification of Carcinogenic Risks for Offsite Residents

Source		MER Conc. ($\mu g/m^3$)	Weight Fraction	Contaminant	URF $(\mu g/m^3)^{-1}$	CPF $(mg/kg/day)^{-1}$	Dose (by age bin) 3rd Trimester (mg/kg-day)	Dose (by age bin) 0 < 2 years (mg/kg-day)	Dose (by age bin) 2 < 16 years (mg/kg-day)	Dose (by age bin) 16 < 70 years (mg/kg-day)	Carcinogenic Risks (by age bin) 3rd Trimester per million	Carcinogenic Risks (by age bin) 0 < 2 years per million	Carcinogenic Risks (by age bin) 2 < 16 years per million	Carcinogenic Risks (by age bin) 16 < 70 years per million	**Total Risk** per million
(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
Unmitigated - OEHHA Methodology															
2017	On-Site Emissions	7.71E-02	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	2.7E-05	8.1E-05			0.85	2.22			3.1
	Truck Route	1.99E-04	1.00E+00		3.0E-04	1.1E+00	6.9E-08	2.1E-07			0.0022	0.006			0.008
2018	On-Site Emissions	3.93E-02	1.00E+00		3.0E-04	1.1E+00		4.1E-05				5.237			5.2
	Truck Route	1.35E-04	1.00E+00		3.0E-04	1.1E+00		1.4E-07				0.018			0.018
2019	On-Site Emissions	2.47E-02	1.00E+00		3.0E-04	1.1E+00		2.6E-05	1.8E-05			2.587	0.124		2.7
	Truck Route	8.67E-05	1.00E+00		3.0E-04	1.1E+00		9.1E-08	6.2E-08			0.009	0.000		0.009
2020	On-Site Emissions	2.33E-02	1.00E+00		3.0E-04	1.1E+00			1.7E-05				0.405		0.40
	Truck Route	7.99E-05	1.00E+00		3.0E-04	1.1E+00			5.7E-08				0.001		0.0014
													Total Cancer Risk		**11.5**
Mitigated Run: Tier 3 Engines for equipment 50 HP or greater															
2017	On-Site Emissions	3.24E-02	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	1.1E-05	3.4E-05			0.36	0.93			1.3
	Truck Route	1.99E-04	1.00E+00		3.0E-04	1.1E+00	6.9E-08	2.1E-07			0.0022	0.006			0.008
2018	On-Site Emissions	2.51E-02	1.00E+00		3.0E-04	1.1E+00		2.6E-05				3.350			3.35
	Truck Route	1.35E-04	1.00E+00		3.0E-04	1.1E+00		1.4E-07				0.018			0.018
2019	On-Site Emissions	1.77E-02	1.00E+00		3.0E-04	1.1E+00		1.8E-05	1.3E-05			1.848	0.088		1.94
	Truck Route	8.67E-05	1.00E+00		3.0E-04	1.1E+00		9.1E-08	6.2E-08			0.009	0.000		0.009
2020	On-Site Emissions	1.90E-02	1.00E+00		3.0E-04	1.1E+00			1.4E-05				0.329		0.329
	Truck Route	7.99E-05	1.00E+00		3.0E-04	1.1E+00			5.7E-08				0.001		0.0014
													Total Cancer Risk		**6.9**

MER UTM coordinates: 587206.94E, 4132456.00N

		3rd Trimester	0 < 2 years	2 < 16 years	16 < 70 years
	exposure year(s)	2017	2017-2019	2019-2020	n/a
Dose Exposure Factors:	exposure frequency (days/year)	350	350	350	350
	inhalation rate (L/kg-day) [1]	361	1090	745	290
	inhalation absorption factor	1	1	1	1
Risk Calculation Factors:	age sensitivity factor	10	10	3	1
	averaging time (years)	70	70	70	70
	fraction of time at home	0.85	0.85	0.72	0.73

exposure durations per age bin		exposure durations (year)			
Construction Year	Risk Scalar [2]	3rd Trimester	0 < 2 years	2 < 16 years	16 < 70 years
2017	0.47	0.25	0.22		
2018	1.00		1.00		
2019	1.00		0.78	0.22	
2020	0.75			0.75	

[1] Inhalation rate taken as the 95th percentile breathing rates (OEHHA, 2015).

[2] Residential risk scalar determined for each year of construction to adjust receptor exposures to the exposure durations for each construction year (see App A - Construction Emissions).

Table C3
Quantification of Non-Carcinogenic Risks
Chronic Hazards for Offsite Residents

Source		REL Type	MER Conc. ($\mu g/m^3$)	Weight Fraction	Contaminant	Chronic Hazards / Toxicological Endpoints*								
						REL ($\mu g/m^3$)	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
Unmitigated														
2017	On-Site Emissions	Chronic	7.71E-02	1.00E+00	Diesel Particulate	5.0E+00	1.5E-02							
	Truck Route		1.99E-04	1.00E+00		5.0E+00	4.0E-05							
2018	On-Site Emissions		3.93E-02	1.00E+00		5.0E+00	7.9E-03							
	Truck Route		1.35E-04	1.00E+00		5.0E+00	2.7E-05							
2019	On-Site Emissions		2.47E-02	1.00E+00		5.0E+00	4.9E-03							
	Truck Route		8.67E-05	1.00E+00		5.0E+00	1.7E-05							
2020	On-Site Emissions		2.33E-02	1.00E+00		5.0E+00	4.7E-03							
	Truck Route		7.99E-05	1.00E+00		5.0E+00	1.6E-05							
TOTAL							3.3E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
					Maximum Chronic Hazard		**0.033**							
Mitigated Run: Tier 3 Engines for equipment 50 HP or greater														
2017	On-Site Emissions	Chronic	3.24E-02	1.00E+00	Diesel Particulate	5.0E+00	6.5E-03							
	Truck Route		1.99E-04	1.00E+00		5.0E+00	4.0E-05							
2018	On-Site Emissions		2.51E-02	1.00E+00		5.0E+00	5.0E-03							
	Truck Route		1.35E-04	1.00E+00		5.0E+00	2.7E-05							
2019	On-Site Emissions		1.77E-02	1.00E+00		5.0E+00	3.5E-03							
	Truck Route		8.67E-05	1.00E+00		5.0E+00	1.7E-05							
2020	On-Site Emissions		1.90E-02	1.00E+00		5.0E+00	3.8E-03							
	Truck Route		7.99E-05	1.00E+00		5.0E+00	1.6E-05							
TOTAL							1.9E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
					Maximum Chronic Hazard		**0.019**							

* Key to Toxicological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
REPRO	Reproductive System
EYES	Eye irritation and/or other effects

Table C4
$PM_{2.5}$ Concentrations at Offsite Residents

Contaminant		Source	MER Conc. ($\mu g/m^3$)	Concentration Annual Average ($\mu g/m^3$)
(a)		(b)	(c)	(d)
Unmitigated				
$PM_{2.5}$	2017	On-Site Emissions	9.26E-02	0.09
		Truck Route	6.19E-04	
	2018	On-Site Emissions	3.69E-02	0.04
		Truck Route	1.21E-03	
	2019	On-Site Emissions	2.33E-02	0.02
		Truck Route	8.20E-04	
	2020	On-Site Emissions	2.20E-02	0.02
		Truck Route	8.30E-04	
	Maximum Annual $PM_{2.5}$ Concentration			**0.09**

Mitigated Run: Tier 3 Engines for equipment 50 HP or greater				
$PM_{2.5}$	2017	On-Site Emissions	5.36E-02	0.05
		Truck Route	6.19E-04	
	2018	On-Site Emissions	2.51E-02	0.03
		Truck Route	1.21E-03	
	2019	On-Site Emissions	1.77E-02	0.02
		Truck Route	8.20E-04	
	2020	On-Site Emissions	1.90E-02	0.020
		Truck Route	8.30E-04	
	Maximum Annual $PM_{2.5}$ Concentration			**0.05**

Appendix

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Appendix D. Operational Risk Calculation Worksheets

Table D1 - On-site HRA
Screening Evaluation

Mobile Source - Screening Evaluation

Residential Exposure Scenario

Source No.	Source	Roadway Orientation	Annual Average Daily Trips	Distance	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Comments
1	Interstate 280	East-West	162,000	370 ft	**29.2**	0.030	0.026	0.25	Highway Screening Analysis Tool
2	Wolfe Road	North-South	55,988	35 ft	**30.9**	0.030	0.030	**0.73**	Roadway Screening Analysis Calculator
3	Pruneridge Ave	East-West	12,624	50 ft	6.16	0.030	0.030	0.16	Roadway Screening Analysis Calculator
BAAQMD Significance Threshold					10.0	1.0	1.0	0.30	For each individual source
Exceeds Threshold?					**Yes**	**No**	**No**	**Yes**	I-280 and Wolfe Rd exceed thresholds

Sources: BAAQMD Highway Screening Analysis Tool - San Clara County 6-ft elevation (2011); BAAQMD Roadway Screening Analysis Calculator (2015).

Stationary Source - Screening Evaluation

Residential Exposure Scenario

Source No.	Source	Distance	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Comments
4	Apple Campus 2	50 ft	1.15	0.302	0.302	0.17	From HRA prepared for Apple Campus 2
BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
Exceeds Threshold?			**No**	**No**	**No**	**No**	

Sources: Apple Campus 2 Draft EIR (LSA Associates, Inc., 2013); health risks determined for the maximum exposed residential sensitive receptors.

Table D2 - On-site HRA
Pollutant Concentration Worksheet
Toxic Air Contaminants and PM2.5

Source No. (a)	Source (b)	Contaminant (c)	Weight Fraction (d)	Emission Rates[1] **Annual Avg** (g/s) (e)	AERMOD Output[2] **Annual Avg** ($\mu g/m^3$) (f)	Annual Average MER Concentration ($\mu g/m^3$) (g)	Emission Rates[1] **1-Hour** (g/s) (h)	AERMOD Output[2] **1-Hour** ($\mu g/m^3$) (i)	Acute (1-Hour) MER Concentration ($\mu g/m^3$) (j)
Residential Scenario									
1	I-280 Trucks (DPM)	Diesel Particulate	1.00E+00	5.14E-04	3.213	0.00165	n/a	n/a	
	I-280 Cars (TOG)	Acetaldehyde	2.80E-03	4.19E-02	4.406	0.00052	5.19E-02	98.130	0.01426
		Acrolein	1.30E-03			0.00024			0.00662
		Benzene	2.83E-02			0.00523			0.14415
		1,3-Butadiene	5.50E-03			0.00102			0.02802
		Ethylbenzene	1.17E-02			0.00216			0.05960
		Formaldehyde	1.58E-02			0.00292			0.08048
		Hexane	3.14E-02			0.00580			0.15994
		Methanol	1.20E-03			0.00022			0.00611
		Methyl Ethyl Ketone	2.00E-04			0.00004			0.00102
		Naphthalene	5.00E-04			0.00009			0.00255
		Propylene	3.06E-02			0.00565			0.15587
		Styrene	1.20E-03			0.00022			0.00611
		Toluene	7.46E-02			0.01378			0.37999
		Xylenes	5.38E-02			0.00993			0.27404
	I-280 All Veh ($PM_{2.5}$)	$PM_{2.5}$	1.00E+00	2.49E-02	4.406	**0.11**	n/a	n/a	
2	Wolfe Rd Trucks (DPM)	Diesel Particulate	1.00E+00	2.94E-04	11.852	0.00348	n/a	n/a	
	Wolfe Rd Cars (TOG)	Acetaldehyde	2.80E-03	2.47E-02	15.800	0.00109	2.73E-02	202.025	0.01544
		Acrolein	1.30E-03			0.00051			0.00717
		Benzene	2.83E-02			0.01102			0.15610
		1,3-Butadiene	5.50E-03			0.00214			0.03034
		Ethylbenzene	1.17E-02			0.00456			0.06454
		Formaldehyde	1.58E-02			0.00615			0.08715
		Hexane	3.14E-02			0.01223			0.17320
		Methanol	1.20E-03			0.00047			0.00662
		Methyl Ethyl Ketone	2.00E-04			0.00008			0.00110
		Naphthalene	5.00E-04			0.00019			0.00276
		Propylene	3.06E-02			0.01192			0.16879
		Styrene	1.20E-03			0.00047			0.00662
		Toluene	7.46E-02			0.02905			0.41150
		Xylenes	5.38E-02			0.02095			0.29676
	Wolfe Rd All Veh	$PM_{2.5}$	1.00E+00	6.82E-03	15.800	**0.11**	n/a	n/a	
Note: Maximum Exposed Receptor (MER)						For Cancer/Chronic Calculation			For Acute Calculation

[1] Emission Rates, per source, from Source Emissions Inventories (Appendix B).

[2] AERMOD Output (Appendix C) at the maximum exposed receptor (MER) are based on unit emission rates for emission sources (1 g/s per source).

Table D3 - On-site HRA
HARP2 Results for Cancer Risk and Chronic Hazards
Residential Scenario

No.	Source	Contaminant	**Carcinogenic Risks**	Chronic Non-Cancer Risks - Toxicological Endpoints*										
			Residential 30-year [1] per million	CV	CNS	IMMUN	KIDNEY	GILV	REPRO	RESP	SKIN	EYE	BONE	ENDO	**BLOOD**
(a)	(b)	(c)	(j)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	I-280 Trucks (DPM)	Diesel Particulate	1.1E+00							3.30E-04					
	I-280 Cars (TOG)	Acetaldehyde	3.2E-03							3.71E-06					
		Acrolein								6.86E-04					
		Benzene	3.2E-01												1.74E-03
		1,3-Butadiene	3.8E-01						5.10E-04						
		Ethylbenzene	1.2E-02				1.08E-06	1.08E-06	1.08E-06					1.08E-06	
		Formaldehyde	3.8E-02							3.24E-04					
		Hexane			8.29E-07										
		Methanol							5.50E-08						
		Methyl Ethyl Ketone													
		Naphthalene	6.7E-03							1.00E-05					
		Propylene								1.88E-06					
		Styrene			2.44E-07										
		Toluene			4.59E-05				4.59E-05	4.59E-05					
		Xylenes			1.42E-05					1.42E-05		1.42E-05			
		Source Total	**1.89**	0.00E+00	6.12E-05	0.00E+00	1.08E-06	1.08E-06	5.57E-04	1.42E-03	0.00E+00	1.42E-05	0.00E+00	1.08E-06	**1.74E-03**
2	Wolfe Rd Trucks	Diesel Particulate	2.4E+00							6.96E-04					
	Wolfe Rd Cars (TOG)	Acetaldehyde	6.8E-03							7.79E-06					
		Acrolein								1.46E-03					
		Benzene	6.8E-01												3.67E-03
		1,3-Butadiene	8.0E-01						1.07E-03						
		Ethylbenzene	2.5E-02				2.28E-06	2.28E-06	2.28E-06					2.28E-06	
		Formaldehyde	8.0E-02							6.83E-04					
		Hexane			1.75E-06										
		Methanol							1.18E-07						
		Methyl Ethyl Ketone													
		Naphthalene	1.4E-02							2.11E-05					
		Propylene								3.97E-06					
		Styrene			5.22E-07										
		Toluene			9.68E-05				9.68E-05	9.68E-05					
		Xylenes			2.99E-05					2.99E-05		2.99E-05			
		Source Total	**3.98**	0.00E+00	1.29E-04	0.00E+00	2.28E-06	2.28E-06	1.17E-03	3.00E-03	0.00E+00	2.99E-05	0.00E+00	2.28E-06	**3.67E-03**

Risk Factors used in CARB's HARP2 Program for Residential Receptors

	3rd Trimester	0 < 2 years	2 < 16 years	16 < 30 years	age bin
Dose Exposure Factors:	350	350	350	350	exposure frequency (days/year)
	361	1090	745	335	inhalation rate (L/kg-day) [2]
	1	1	1	1	inhalation absorption factor
Risk Calculation Factors:	10	10	3	1	age sensitivity factor
	0.25	2	14	14	exposure duration (years)
	70	70	70	70	averaging time (years)
	0.85	0.85	0.72	0.73	fraction of time at home

* Key to Toxicological Endpoints

CV	Cardiovascular System
CNS	Central Nervous System
IMMUN	Immune System
KIDN	Kidneys
GILV	Gastrointestinal Tract and Liver/Alimentary Tract
RESP	Respiratory System
REPRO	Reproductive System
SKIN	Skin irritation and/or other effects
EYE	Eye irritation and/or other effects
BONE	Bones and Teeth
ENDO	Endocrine System
BLOOD	Hematological System

[1] For informational purposes, the 70-year cancer risks for I-280 and Wolfe Rd are 2.2 and 4.7 in a million, respectively. The 9-year cancer risks for I-280 and Wolfe Rd are 1.4 and 2.8 in a million, respectively.

[2] Inhalation rate taken as the 95th percentile breathing rates (OEHHA, 2015).

Table D4 - On-site HRA
HARP2 Results for Acute Hazards
Residential Scenario

Source No.	Source	Contaminant	Acute Non-Cancer Risks - Toxicological Endpoints*										
			CV	CNS	IMMUN	KIDNEY	GILV	**REPRO**	RESP	SKIN	EYE	BONE	ENDO	BLOOD
(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	I-280 Trucks (DPM)	Diesel Particulate												
	I-280 Cars (TOG)	Acetaldehyde							3.03E-05		3.03E-05			
		Acrolein							2.65E-03		2.65E-03			
		Benzene			5.34E-03			5.34E-03						5.34E-03
		1,3-Butadiene						4.25E-05						
		Ethylbenzene												
		Formaldehyde									1.46E-03			
		Hexane												
		Methanol		2.18E-07										
		Methyl Ethyl Ketone							7.85E-08		7.85E-08			
		Naphthalene												
		Propylene												
		Styrene	2.91E-07					2.91E-07	2.91E-07		2.91E-07			
		Toluene		1.03E-05				1.03E-05	1.03E-05		1.03E-05			
		Xylenes		1.25E-05					1.25E-05		1.25E-05			
		Source Total	2.91E-07	2.29E-05	5.34E-03	0.00E+00	0.00E+00	**5.39E-03**	2.70E-03	0.00E+00	4.16E-03	0.00E+00	0.00E+00	5.34E-03
2	Wolfe Rd Trucks (DPM)	Diesel Particulate												
	Wolfe Rd Cars (TOG)	Acetaldehyde							3.29E-05		3.29E-05			
		Acrolein							2.87E-03		2.87E-03			
		Benzene			5.78E-03			5.78E-03						5.78E-03
		1,3-Butadiene						4.60E-05						
		Ethylbenzene												
		Formaldehyde									1.58E-03			
		Hexane												
		Methanol		2.36E-07										
		Methyl Ethyl Ketone							8.46E-08		8.46E-08			
		Naphthalene												
		Propylene												
		Styrene	3.15E-07					3.15E-07	3.15E-07		3.15E-07			
		Toluene		1.11E-05				1.11E-05	1.11E-05		1.11E-05			
		Xylenes		1.22E-05					1.22E-05		1.22E-05			
		Source Total	3.15E-07	2.36E-05	5.78E-03	0.00E+00	0.00E+00	**5.84E-03**	2.92E-03	0.00E+00	4.51E-03	0.00E+00	0.00E+00	5.78E-03

* Key to Toxicological Endpoints

CV	Cardiovascular System	RESP	Respiratory System
CNS	Central Nervous System	SKIN	Skin irritation and/or other effects
IMMUN	Immune System	EYE	Eye irritation and/or other effects
KIDN	Kidneys	BONE	Bones and Teeth
GILV	Gastrointestinal Tract and Liver/Alimentary Tract	ENDO	Endocrine System
REPRO	Reproductive System	BLOOD	Hematological System

Table D5 - Summary of On-site Health Risks
Quantification of Carcinogenic Risks and Non-Carcinogenic Risks
Individual Sources and Cumulative

Health Risk Summary

Residential Scenario - Health Risk Values

Source No.	Source	Cancer Risk (per	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Methodology
REFINED MODELING VALUES						
1	Interstate 280	1.89	0.002	0.005	0.11	ISCST3 air dispersion modeling
2	Wolfe Road	3.98	0.004	0.006	0.11	ISCST3 air dispersion modeling
SCREENING ANALYSIS VALUES						
3	Pruneridge Avenue	6.16	0.03	0.03	0.16	Roadway Screening Analysis Calculator
4	Apple Campus 2	1.15	0.30	0.30	0.17	From HRA prepared for Apple Campus 2
	BAAQMD Significance Threshold	10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?	**No**	**No**	**No**	**No**	
	Cumulative Total	13.2	0.34	0.34	0.54	For ALL Sources
	BAAQMD Significance Threshold	100	10.0	10.0	0.80	
	Exceeds Threhold?	**No**	**No**	**No**	**No**	