APPENDIX D:
Health Risk Assessment

1. Health Risk Assessment

1.1 CONSTRUCTION HEALTH RISK ASSESSMENT

The proposed project includes removal of all three existing structures on-site and construction of a new fire station. The proposed Project would replace the existing Fire Station 41 located approximately 600 feet to the west of the Project site at 531 Obispo Road. The Project site is a 2.5-acre parcel of land bound by Avenue Alhambra to the north, Coronado Street to the east, Obispo Road to the south, and Avenue Portola to the west in El Granada, San Mateo County, California. This technical memorandum presents the background methodology used for the construction 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 October 2016 and be completed by the end of December 2017 (approximately 315 workdays). The nearest off-site sensitive receptors to the proposed project are the adjacent single-family residences to the north, across Avenue Alhambra. 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 100 meters (328 feet) that would screen out potential health risks and therefore could be potentially impacted from the proposed construction activities. As a result, a site-specific construction health risk assessment (HRA) has been prepared for the proposed project. This HRA considers the health impact to off-site sensitive receptors (adults and children in the nearby residences; students at Wilkinson School and El Granada Elementary School) from construction emissions at the project site, including diesel equipment exhaust (diesel particulate matter or DPM) and particulate matter less than 2.5 microns ($PM_{2.5}$).

It should be noted that these health impacts are based on conservative (i.e., health protective) assumptions. The United States Environmental Protection Agency (USEPA, 2005) and the Office of Environmental Health Hazard Assessment (OEHHA, 2015) note that conservative assumptions used in a risk assessment are intended to ensure that the estimated risks do not underestimate the actual risks. Therefore, the estimated risks may not necessarily represent actual risks experienced by populations at or near a site. The use of conservative assumptions tends to produce upper-bound estimates of exposure and thus risk. For this residential-based risk assessment, the following conservative assumptions were used:

For this residential-based risk assessment, the following conservative assumptions were used:

- It was assumed that the maximum exposed receptor (MER), which includes children and adults, stood outside of their residences for 24 hours per day, 350 days per year. In reality, California residents typically

will spend a maximum of just over one hour per day outdoors at their residences (California Air Resources Board, 1991). This would result in lower estimated risk values.

- The calculated risk for infants from third trimester to age 2 is multiplied by a factor of 10 to account for early life exposure and uncertainty in child versus adult exposure impacts.

For school-based receptors, the following conservative assumptions were used:

- It was assumed that the MER stood outside for 8 hours per day, 180 days per year (i.e. school days per year). In reality, most students typically will spend a maximum of two hour per day outdoors for nutrition, lunch and physical education classes. This would result in lower estimated risk values.

- The calculated risk for children age 2 to age 16 is multiplied by a factor of 3 to account for early life exposure and uncertainty in child versus adult exposure impacts.

1.2 METHODOLOGY AND SIGNIFICANCE THRESHOLDS

For this HRA, the BAAQMD significance thresholds were deemed to be appropriate and the thresholds that were used for this project are shown below:

- 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 $\mu g/m^3$

The methodology used in this HRA is consistent with the following BAAQMD and the OEHHA guidance documents:

- 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. Using air dispersion models and BAAQMD's screening tools, 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.

1.3 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 per day. The $PM_{2.5}$ emissions were taken from the CalEEMod output for exhaust $PM_{2.5}$ presented in lbs per day.

The project was assumed to take place over 14 months (315 work days) from October 2016 through the end of December 2017. 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., 2016 and 2017). The CalEEMod construction emissions output and emission rate calculations are provided in Appendix A of the HRA.

1.4 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 emission rates are those described in Section 1.3. Meteorological data obtained from the BAAQMD for the nearest representative meteorological station (Fort Funston) with the three latest available years of record were used to represent local weather conditions and prevailing winds.

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 diesel truck traffic, and an initial vertical dispersion parameter of 1.93 m was used, per California Air Resources Board (CARB) guidance (2000).

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 construction 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 all modeling runs, a unit emission rate of 1 gram per second 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 hauling emissions. The maximum modeled 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 residences across Avenue Alhambra, and at nearby Wilkinson School (grades K-8) and El Granada Elementary Schools (grades K-5). The model output DPM and $PM_{2.5}$ concentrations are provided in Tables C1, C2, and C3 of Appendix C for off-site residential receptors, K-8 school receptors, and

elementary (K-5) school receptors, respectively. The air dispersion model output for the emission sources is presented in Appendix B.

1.5 RISK CHARACTERIZATION

1.5.1 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 residential receptors, the following dose algorithm was used.

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

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. For residential receptors, 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). An EF of 180 days is utilized for students to represent school days per year (OEHHA, 2004). 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:

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. 315 work days or 1.2 years). As the length of construction is less than 2.25 years, only the third trimester and 0-2 age bins apply to the construction analysis for the off-site residential receptors. The 2-16 age group was utilized for the students at Wilkinson School (grades K-8), and the 2-9 age group was utilized for the students at El Granada Elementary School (grades K-5).

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 (for residential receptors only)
ED	=	exposure duration (years)
AT	=	averaging time period over which exposure duration is averaged (70 years)

The CPFs used in the assessment were obtained from OEHHA guidance. The excess lifetime cancer risks during the construction period 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 and 0 to 2 year old age groups. For the off-site students, the calculated cancer risks for these receptors are based on the 2-16 year old age group for Wilkinson School and the 2-9 year old age group for El Granada Elementary School. 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 1×10^6 (i.e. 1 million).

The calculated results are provided in Appendix C.

1.5.2 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.

The chronic hazard analysis for DPM is provided in Appendix C. The calculations contain the relevant exposure concentrations and corresponding reference dose values used in the evaluation of non-carcinogenic exposures.

1.5.3 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.

1.6 CONSTRUCTION HRA RESULTS

The calculated results are provided in Appendix C and the results are summarized in the following table.

TABLE 1. CONSTRUCTION RISK SUMMARY – UNMITIGATED

Receptor	Cancer Risk (per million)	Chronic Hazards	$PM_{2.5}$ ($\mu g/m^3$)[a]
Maximum Exposed Receptor - Residence	81.0	0.24	0.57
Wilkinson School (K-8)	1.0	0.028	0.07
El Granada Elementary School (K-5)	0.2	0.005	0.01
BAAQMD Threshold	10	1.0	0.3
Exceeds Threshold?	Yes	No	Yes

Note: Cancer risk calculated using 2015 OEHHA HRA guidance.
a. From year 2016, which represents the highest maximum annual $PM_{2.5}$ concentration.
Source: Lakes AERMOD View, 9.1 (2015).

Cancer risk for the residences across Avenue Alhambra (i.e. MER) from unmitigated project-related construction emissions was calculated to be 81 in a million, which would exceed the 10 in a million significance threshold. In accordance with the latest 2015 OEHHA guidance, the calculated total cancer risk conservatively assumes that the risk for the residences across Avenue Alhambra consists of a pregnant woman in the third trimester that subsequently gives birth to an infant during the 14-month construction period; therefore, all calculated risk values were multiplied by a factor of 10. In addition, it was conservatively assumed that the residents were outdoors 24 hours a day, 350 days per year and exposed to all of the daily construction emissions. However, the calculated cancer risks for students at Wilkinson School and El Granada Elementary School are well below the 10 in a million significance threshold.

For non-carcinogenic effects, the chronic hazard index identified for each toxicological endpoint totaled less than one for all off-site sensitive receptors. Therefore, chronic non-carcinogenic hazards are within acceptable limits. The highest $PM_{2.5}$ annual concentration at nearby residences was calculated to be 0.57, which would exceed the BAAQMD significance threshold of 0.3 micrograms per cubic meter ($\mu g/m^3$). The determined $PM_{2.5}$ annual concentrations at the off-site schools are below the 0.3 $\mu g/m^3$ significance threshold.

Because cancer risk and the $PM_{2.5}$ concentration for the residences across Avenue Alhambra would exceed BAAQMD's significance thresholds due to unmitigated construction activities associated with the proposed project, the following mitigation measure is proposed:

> **Mitigation Measure AIR-2:** During construction, the construction contractor(s) shall use construction equipment fitted with Level 3 Diesel Particulate Filters (DPF) and engines that meet the USEPA Certified Tier 3 emissions standards for all equipment of 25 horsepower or more. The construction contractor shall maintain a list of all operating equipment in use on the project site for verification by the County of San Mateo Building Division official or his/her designee. The construction equipment list shall state the makes, models, and number of construction equipment on-site. Equipment shall be properly serviced and maintained in accordance with manufacturer recommendations. The construction contractor shall ensure that all non-essential idling of construction equipment is restricted to five minutes or less in compliance with California Air Resources Board Rule 2449. Prior to issuance of any construction permit, the construction contractor shall ensure that all construction plans submitted to the County of San Mateo Planning Division and/or Building Division clearly show the requirement for Level 3 DPF and USEPA Tier 3 or higher emissions standards for construction equipment over 25 horsepower.

Mitigation Measure AIR-2 would reduce the project's localized construction emissions, as shown in the following table. The results indicate that, with mitigation, cancer risk and $PM_{2.5}$ annual concentrations would be less than the BAAQMD's significance thresholds for residential and school-based receptors. Therefore, the project would not expose off-site sensitive receptors to substantial concentrations of air pollutant emissions during construction and impacts would be *less than significant with mitigation*.

TABLE 2 CONSTRUCTION RISK SUMMARY – MITIGATED

Receptor	Cancer Risk (per million)	Chronic Hazards	$PM_{2.5}$ ($\mu g/m^3$)[a]
Maximum Exposed Receptor - Residence	8.4	0.020	0.06
Wilkinson School (K-8)	0.10	0.002	0.01
El Granada Elementary School (K-5)	0.02	<0.001	<0.01
BAAQMD Threshold	10	1.0	0.3
Exceeds Threshold?	No	No	No

Notes: Cancer risk calculated using 2015 OEHHA HRA guidance.
Risks incorporate Mitigation Measure AIR-2, which includes using construction equipment with Level 3 Diesel Particulate Filters and Tier 3 engines for equipment over 25 horsepower.
a. From year 2017, which represents the highest maximum annual $PM_{2.5}$ concentration.
Source: Lakes AERMOD View, 9.1 (2015).

2. References

Bay Area Air Quality Management District. 2012a. *California Environmental Quality Act Air Quality Guidelines.*

———. 2012b. *Recommended Methods for Screening and Modeling Local Risks and Hazards.* Version 3.0. Dated May 2012.

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California Air Resources Board (CARB). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.*

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Office of Environmental Health Hazard Assessment (OEHHA). 2015. *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments.* Dated February, 2015.

_____. 2004. *Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites.* Dated February, 2004.

United States Environmental Protection Agency (USEPA). 2005. *Guideline on Air Quality Models* (Revised). EPA-450/2-78-027R.

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Appendix A. Emission Rate Calculations

Construction Emissions - DPM and PM2.5
Emission Rate Inputs for Risk Calculations

On-site Construction Emissions		DPM [1]	$PM_{2.5}$ [2]
2016 On-site Emissions	Average Daily Emissions (lbs/day)	1.15	1.08
	Average Daily Emissions (lbs/hr)	1.44E-01	1.36E-01
	Emission Rate (g/s)	1.81E-02	1.71E-02
2017 On-site Emissions	Average Daily Emissions (lbs/day)	1.10	1.07
	Average Daily Emissions (lbs/hr)	1.38E-01	1.34E-01
	Emission Rate (g/s)	1.74E-02	1.69E-02

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

Off-site Construction Emissions		DPM [1]	$PM_{2.5}$ [2]
2016 Off-site Emissions	Haul Length Daily Emissions (lbs/day)	0.096	0.088
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	2.25E-03	2.08E-03
	Emission Rate (lbs/hr)	2.81E-04	2.59E-04
	Emission Rate (g/s)	3.54E-05	3.27E-05
2017 Off-site Emissions	Haul Length Daily Emissions (lbs/day)	0.027	0.025
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	6.43E-04	5.90E-04
	Emission Rate (lbs/hr)	8.04E-05	7.37E-05
	Emission Rate (g/s)	1.01E-05	9.29E-06

Note: Emissions evenly distributed over 79 modeled volume sources.

Hours per work day (7:00 AM to 4:00 PM, 1-hour of breaks) [4] 8 hours

			Risk Scalar [5]
Total construction days per year	2016-2017		
	2016	60	0.23
	2017	255	0.98

Hauling Length (miles)	20
Haul Length within 1,000 ft of Site (mile) [3]	0.47

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

[2] $PM_{2.5}$ emissions taken as $PM_{2.5}$ exhaust emissions from CalEEMod average daily emissions.

[3] Emissions from CalEEMod off-site average daily emissions, which is based on proportioned haul truck trip distance of 20 miles (CalEEMod Default), are proportioned to evaluate emissions from the **0.47-**mile route within 1,000 of the project site.

[4] Work hours applied in By Hour/Day (HRDOW) variable emissions module in air dispersion model (see App B - Air Dispersion Model Output Files).

[5] 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).

Construction Emissions - DPM and PM2.5
Emission Rate Inputs for Risk Calculations
Mitigation - Tier 3 Engines and Level 3 DPFs for Eq. > 25 hp

On-site Construction Emissions - Mitigated		DPM [1]	$PM_{2.5}$ [2]
2016 On-site Emissions	Average Daily Emissions (lbs/day)	0.075	0.075
	Average Daily Emissions (lbs/hr)	9.33E-03	9.33E-03
	Emission Rate (g/s)	1.18E-03	1.18E-03
2017 On-site Emissions	Average Daily Emissions (lbs/day)	0.117	0.117
	Average Daily Emissions (lbs/hr)	1.46E-02	1.46E-02
	Emission Rate (g/s)	1.84E-03	1.84E-03

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

Off-site Construction Emissions - Mitigated		DPM [1]	$PM_{2.5}$ [2]
2016 Off-site Emissions	Haul Length Daily Emissions (lbs/day)	0.096	0.088
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	2.25E-03	2.08E-03
	Emission Rate (lbs/hr)	2.81E-04	2.59E-04
	Emission Rate (g/s)	3.54E-05	3.27E-05
2017 Off-site Emissions	Haul Length Daily Emissions (lbs/day)	0.027	0.025
	Hauling Emissions w/in 1,000 ft (lbs/day) [3]	6.43E-04	5.90E-04
	Emission Rate (lbs/hr)	8.04E-05	7.37E-05
	Emission Rate (g/s)	1.01E-05	9.29E-06

Note: Emissions evenly distributed over 79 modeled volume sources.

Hours per work day (7:00 AM to 4:00 PM, 1-hour of breaks) [4] 8 hours

			Risk Scalar [5]
Total construction days per year	2016-2017		
	2016	60	0.23
	2017	255	0.98

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

[2] $PM_{2.5}$ emissions taken as $PM_{2.5}$ exhaust emissions from CalEEMod average daily emissions.

[3] Emissions from CalEEMod off-site average daily emissions, which is based on proportioned haul truck trip distance of 20 miles (CalEEMod Default), are proportioned to evaluate emissions from the **0.47-**mile route within 1,000 of the project site.

[4] Work hours applied in By Hour/Day (HRDOW) variable emissions module in air dispersion model (see App B - Air Dispersion Model Output Files).

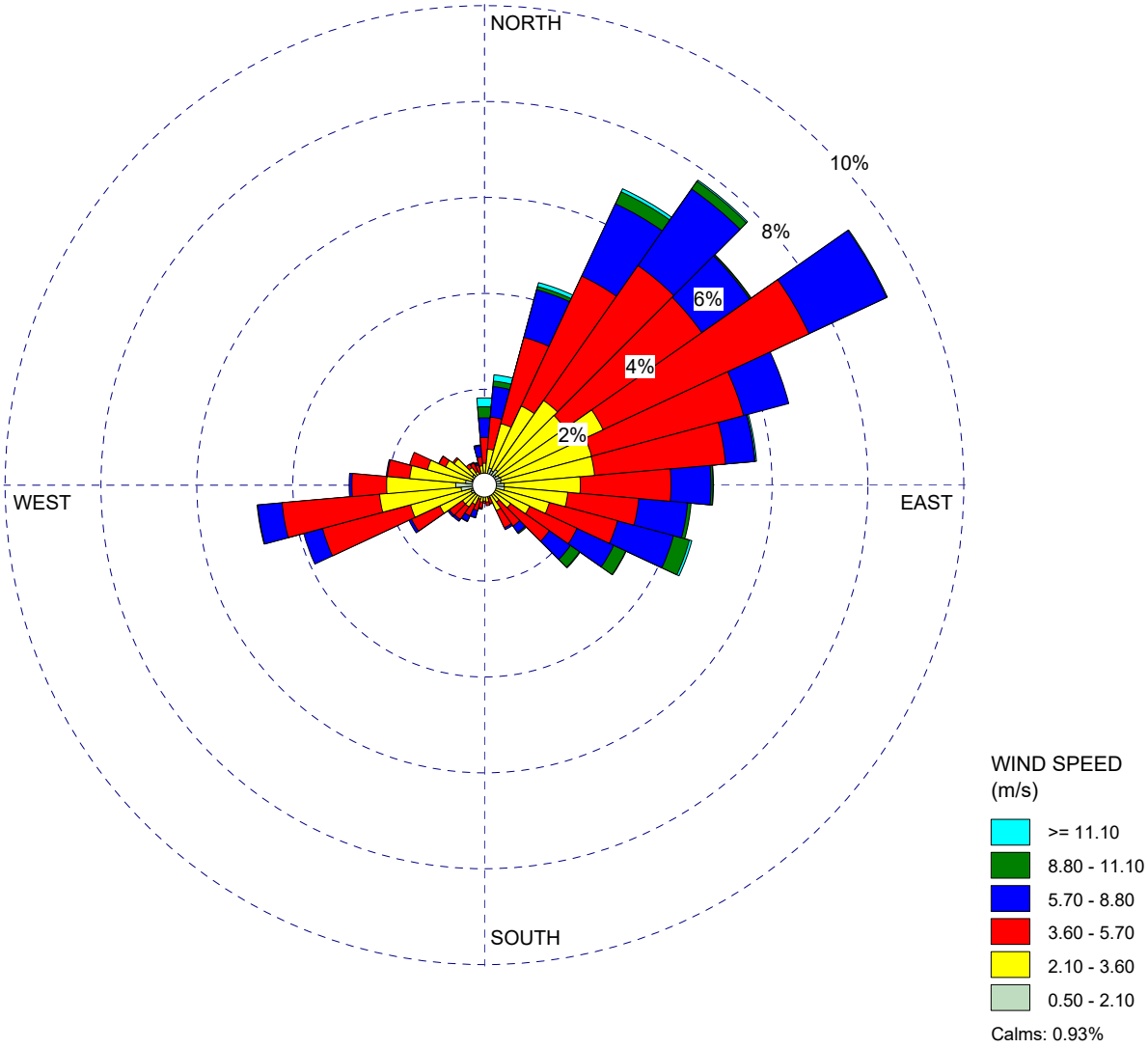
[5] Risk scalars determined for each year of construction to adjust receptor exposures to the exposure durations for each construction year (see App C - Risk Calculations).

WIND ROSE PLOT:

Fort Funston Meteorological Station
2003-2005

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS: Work Hours (7AM-4PM)	DATA PERIOD: **Start Date: 1/1/2003 - 07:00** **End Date: 12/31/2005 - 15:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.93%**	TOTAL COUNT: **9864 hrs.**	
	AVG. WIND SPEED: **4.25 m/s**	DATE: **9/21/2016**	PROJECT NO.: **CFPD-01.0**

Appendix B. Air Dispersion Model Output

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Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

```
*** ISCST3 - VERSION 02035 ***    *** FS 41 Res                                                    ***        09/19/16
                                   ***                                                             ***        12:01:54
**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:    78 Source(s);      2 Source Group(s); and     353 Receptor(s)

**The Model Assumes A Pollutant Type of:  PM

**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 - Residential Receptors
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 =     1.4 MB of RAM.

**Input Runstream File:          FS41Res.INP
**Output Print File:             FS41Res.OUT
**Detailed Error/Message File:   FS41Res.err
```

Model Output - Residential Receptors
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	0.12987E-01	546987.4	4150566.0	18.0	0.00	4.53	1.93	SHRDOW
L0000002	0	0.12987E-01	546995.6	4150560.5	18.0	0.00	4.53	1.93	SHRDOW
L0000003	0	0.12987E-01	547003.7	4150555.2	17.9	0.00	4.53	1.93	SHRDOW
L0000004	0	0.12987E-01	547011.9	4150550.0	17.9	0.00	4.53	1.93	SHRDOW
L0000005	0	0.12987E-01	547020.0	4150544.5	19.3	0.00	4.53	1.93	SHRDOW
L0000006	0	0.12987E-01	547028.2	4150539.2	19.7	0.00	4.53	1.93	SHRDOW
L0000007	0	0.12987E-01	547036.3	4150534.0	20.0	0.00	4.53	1.93	SHRDOW
L0000008	0	0.12987E-01	547044.5	4150528.8	15.1	0.00	4.53	1.93	SHRDOW
L0000009	0	0.12987E-01	547052.6	4150523.2	15.4	0.00	4.53	1.93	SHRDOW
L0000010	0	0.12987E-01	547060.8	4150518.0	15.6	0.00	4.53	1.93	SHRDOW
L0000011	0	0.12987E-01	547068.9	4150512.8	15.9	0.00	4.53	1.93	SHRDOW
L0000012	0	0.12987E-01	547077.1	4150507.2	16.1	0.00	4.53	1.93	SHRDOW
L0000013	0	0.12987E-01	547085.3	4150502.0	16.4	0.00	4.53	1.93	SHRDOW
L0000014	0	0.12987E-01	547086.2	4150494.8	16.3	0.00	4.53	1.93	SHRDOW
L0000015	0	0.12987E-01	547082.1	4150486.0	16.1	0.00	4.53	1.93	SHRDOW
L0000016	0	0.12987E-01	547077.9	4150477.2	16.0	0.00	4.53	1.93	SHRDOW
L0000017	0	0.12987E-01	547073.6	4150468.5	16.0	0.00	4.53	1.93	SHRDOW
L0000018	0	0.12987E-01	547069.4	4150459.5	15.9	0.00	4.53	1.93	SHRDOW
L0000019	0	0.12987E-01	547062.0	4150460.0	15.8	0.00	4.53	1.93	SHRDOW
L0000020	0	0.12987E-01	547053.2	4150464.2	15.7	0.00	4.53	1.93	SHRDOW
L0000021	0	0.12987E-01	547044.4	4150468.5	15.3	0.00	4.53	1.93	SHRDOW
L0000022	0	0.12987E-01	547035.7	4150472.8	14.6	0.00	4.53	1.93	SHRDOW
L0000023	0	0.12987E-01	547026.9	4150477.0	13.8	0.00	4.53	1.93	SHRDOW
L0000024	0	0.12987E-01	547018.2	4150481.2	12.4	0.00	4.53	1.93	SHRDOW
L0000025	0	0.12987E-01	547009.4	4150485.5	12.1	0.00	4.53	1.93	SHRDOW
L0000026	0	0.12987E-01	547000.6	4150489.8	12.0	0.00	4.53	1.93	SHRDOW
L0000027	0	0.12987E-01	546991.9	4150494.0	11.9	0.00	4.53	1.93	SHRDOW
L0000028	0	0.12987E-01	546983.1	4150498.2	11.7	0.00	4.53	1.93	SHRDOW
L0000029	0	0.12987E-01	546974.3	4150502.5	11.4	0.00	4.53	1.93	SHRDOW
L0000030	0	0.12987E-01	546965.6	4150506.8	11.0	0.00	4.53	1.93	SHRDOW
L0000031	0	0.12987E-01	546956.8	4150511.0	10.4	0.00	4.53	1.93	SHRDOW
L0000032	0	0.12987E-01	546948.1	4150515.2	9.8	0.00	4.53	1.93	SHRDOW
L0000033	0	0.12987E-01	546939.3	4150519.5	9.2	0.00	4.53	1.93	SHRDOW
L0000034	0	0.12987E-01	546930.5	4150523.8	8.7	0.00	4.53	1.93	SHRDOW
L0000035	0	0.12987E-01	546921.8	4150528.0	6.2	0.00	4.53	1.93	SHRDOW
L0000036	0	0.12987E-01	546913.0	4150532.3	10.8	0.00	4.53	1.93	SHRDOW
L0000037	0	0.12987E-01	546904.2	4150536.5	10.9	0.00	4.53	1.93	SHRDOW

Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

L0000038	0	0.12987E-01	546895.5	4150540.8	11.2	0.00	4.53	1.93	SHRDOW
L0000039	0	0.12987E-01	546886.7	4150545.0	11.5	0.00	4.53	1.93	SHRDOW
L0000040	0	0.12987E-01	546877.9	4150549.2	11.6	0.00	4.53	1.93	SHRDOW
L0000041	0	0.12987E-01	546869.2	4150553.5	11.6	0.00	4.53	1.93	SHRDOW
L0000042	0	0.12987E-01	546860.4	4150557.8	11.3	0.00	4.53	1.93	SHRDOW
L0000043	0	0.12987E-01	546851.6	4150562.0	10.9	0.00	4.53	1.93	SHRDOW
L0000044	0	0.12987E-01	546842.9	4150566.2	10.3	0.00	4.53	1.93	SHRDOW
L0000045	0	0.12987E-01	546834.1	4150570.5	8.2	0.00	4.53	1.93	SHRDOW
L0000046	0	0.12987E-01	546825.4	4150574.8	7.4	0.00	4.53	1.93	SHRDOW
L0000047	0	0.12987E-01	546816.6	4150579.0	6.7	0.00	4.53	1.93	SHRDOW
L0000048	0	0.12987E-01	546807.8	4150583.3	6.2	0.00	4.53	1.93	SHRDOW
L0000049	0	0.12987E-01	546799.1	4150587.5	6.0	0.00	4.53	1.93	SHRDOW
L0000050	0	0.12987E-01	546790.3	4150591.8	5.8	0.00	4.53	1.93	SHRDOW
L0000051	0	0.12987E-01	546781.6	4150596.0	5.7	0.00	4.53	1.93	SHRDOW
L0000052	0	0.12987E-01	546772.8	4150600.2	5.5	0.00	4.53	1.93	SHRDOW
L0000053	0	0.12987E-01	546764.0	4150604.5	5.3	0.00	4.53	1.93	SHRDOW
L0000054	0	0.12987E-01	546755.2	4150608.5	5.0	0.00	4.53	1.93	SHRDOW
L0000055	0	0.12987E-01	546746.5	4150612.8	3.7	0.00	4.53	1.93	SHRDOW
L0000056	0	0.12987E-01	546737.8	4150617.0	3.3	0.00	4.53	1.93	SHRDOW
L0000057	0	0.12987E-01	546728.9	4150621.3	7.7	0.00	4.53	1.93	SHRDOW
L0000058	0	0.12987E-01	546720.2	4150625.5	7.5	0.00	4.53	1.93	SHRDOW
L0000059	0	0.12987E-01	546711.4	4150629.8	7.5	0.00	4.53	1.93	SHRDOW
L0000060	0	0.12987E-01	546702.7	4150634.0	7.5	0.00	4.53	1.93	SHRDOW
L0000061	0	0.12987E-01	546693.9	4150638.2	7.6	0.00	4.53	1.93	SHRDOW
L0000062	0	0.12987E-01	546685.1	4150642.5	7.5	0.00	4.53	1.93	SHRDOW
L0000063	0	0.12987E-01	546676.4	4150646.8	7.1	0.00	4.53	1.93	SHRDOW
L0000064	0	0.12987E-01	546667.6	4150651.0	6.3	0.00	4.53	1.93	SHRDOW
L0000065	0	0.12987E-01	546658.9	4150655.2	4.5	0.00	4.53	1.93	SHRDOW
L0000066	0	0.12987E-01	546650.1	4150659.5	3.7	0.00	4.53	1.93	SHRDOW
L0000067	0	0.12987E-01	546641.3	4150663.8	3.2	0.00	4.53	1.93	SHRDOW
L0000068	0	0.12987E-01	546632.6	4150668.0	3.1	0.00	4.53	1.93	SHRDOW
L0000069	0	0.12987E-01	546623.8	4150672.3	3.0	0.00	4.53	1.93	SHRDOW
L0000070	0	0.12987E-01	546615.1	4150676.5	2.9	0.00	4.53	1.93	SHRDOW
L0000071	0	0.12987E-01	546606.2	4150680.8	2.7	0.00	4.53	1.93	SHRDOW
L0000072	0	0.12987E-01	546597.5	4150685.0	2.3	0.00	4.53	1.93	SHRDOW
L0000073	0	0.12987E-01	546588.8	4150689.2	2.0	0.00	4.53	1.93	SHRDOW
L0000074	0	0.12987E-01	546580.0	4150693.5	1.6	0.00	4.53	1.93	SHRDOW
L0000075	0	0.12987E-01	546571.2	4150697.8	1.4	0.00	4.53	1.93	SHRDOW
L0000076	0	0.12987E-01	546562.4	4150702.0	0.7	0.00	4.53	1.93	SHRDOW
L0000077	0	0.12987E-01	546553.7	4150706.2	0.6	0.00	4.53	1.93	SHRDOW

*** 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	0.32711E-03	546973.4	4150585.8	17.5	4.15	5	1.93	SHRDOW

Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
SRCGP1	PAREA1 ,
SRCGP2	L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007, L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017, 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, L0000052, L0000053, L0000054, L0000055, L0000056, L0000057, L0000058, L0000059, L0000060, L0000061, L0000062, L0000063, L0000064, L0000065, L0000066, L0000067, L0000068, L0000069, L0000070, L0000071, L0000072, L0000073, L0000074, L0000075, L0000076, L0000077,

Model Output - Residential Receptors
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 = POLY-AREA ; SOURCE ID = L0000001 through L0000077; 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 and 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 = SATURDAY and 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 = SATURDAY and 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 = FALL ; DAY OF WEEK = SATURDAY and 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 - Residential Receptors
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

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

(547007.6,	4150621.8,	22.8,	1.5);	(547000.2,	4150631.5,	23.4,	1.5);
(546979.9,	4150640.0,	23.5,	1.5);	(546986.9,	4150650.0,	23.9,	1.5);
(546974.6,	4150660.8,	23.7,	1.5);	(546968.8,	4150653.3,	23.4,	1.5);
(546958.7,	4150661.2,	22.9,	1.5);	(546943.8,	4150669.8,	21.8,	1.5);
(546929.9,	4150699.5,	19.1,	1.5);	(546905.4,	4150722.0,	23.6,	1.5);
(546901.8,	4150714.0,	23.0,	1.5);	(546893.2,	4150703.8,	17.8,	1.5);
(546885.2,	4150737.8,	24.3,	1.5);	(546876.8,	4150737.8,	24.3,	1.5);
(546814.4,	4150756.5,	19.4,	1.5);	(546819.2,	4150765.5,	19.8,	1.5);
(546824.0,	4150773.0,	20.2,	1.5);	(546830.4,	4150724.0,	19.9,	1.5);
(546819.2,	4150729.3,	19.2,	1.5);	(546810.2,	4150733.5,	18.9,	1.5);
(546753.2,	4150737.2,	18.3,	1.5);	(546740.5,	4150744.8,	16.6,	1.5);
(546752.2,	4150771.5,	18.2,	1.5);	(546741.6,	4150776.8,	16.5,	1.5);
(546777.2,	4150757.0,	18.9,	1.5);	(546783.6,	4150765.5,	18.8,	1.5);
(546786.8,	4150778.2,	18.8,	1.5);	(546841.6,	4150809.2,	28.5,	1.5);
(546793.7,	4150824.0,	25.3,	1.5);	(546827.3,	4150852.8,	27.1,	1.5);
(546814.4,	4150853.8,	26.2,	1.5);	(546799.6,	4150858.8,	25.8,	1.5);
(546764.9,	4150862.5,	25.5,	1.5);	(546743.1,	4150867.2,	23.3,	1.5);
(546721.3,	4150868.8,	21.5,	1.5);	(546702.2,	4150873.5,	20.7,	1.5);
(546712.8,	4150839.5,	21.0,	1.5);	(546729.8,	4150835.8,	21.9,	1.5);
(546741.6,	4150833.0,	23.4,	1.5);	(546755.9,	4150831.0,	25.3,	1.5);
(546864.5,	4150838.0,	30.7,	1.5);	(546921.4,	4150761.8,	24.8,	1.5);
(546944.8,	4150751.8,	28.0,	1.5);	(546958.7,	4150740.0,	28.8,	1.5);
(546982.1,	4150762.8,	29.9,	1.5);	(546957.6,	4150778.8,	28.9,	1.5);
(546942.2,	4150797.5,	28.0,	1.5);	(546933.7,	4150782.0,	27.4,	1.5);
(546994.3,	4150805.5,	34.5,	1.5);	(547009.8,	4150795.2,	30.2,	1.5);
(547018.3,	4150788.5,	30.5,	1.5);	(547033.7,	4150819.8,	38.2,	1.5);
(547024.7,	4150830.5,	37.7,	1.5);	(547006.1,	4150843.8,	36.0,	1.5);
(546974.1,	4150868.3,	35.6,	1.5);	(547040.1,	4150765.5,	33.1,	1.5);
(547053.9,	4150752.8,	33.8,	1.5);	(547071.5,	4150729.8,	33.7,	1.5);
(547081.1,	4150721.2,	33.4,	1.5);	(547089.1,	4150708.0,	28.5,	1.5);
(547099.7,	4150689.0,	29.2,	1.5);	(547133.2,	4150691.5,	32.2,	1.5);
(547144.4,	4150694.2,	32.4,	1.5);	(547127.9,	4150718.2,	37.2,	1.5);
(547123.6,	4150730.5,	37.8,	1.5);	(547108.2,	4150738.5,	36.0,	1.5);
(547098.6,	4150755.0,	35.2,	1.5);	(547083.8,	4150770.2,	34.2,	1.5);
(547073.1,	4150783.5,	34.0,	1.5);	(547066.7,	4150682.0,	27.9,	1.5);
(547028.9,	4150717.0,	31.7,	1.5);	(547005.5,	4150696.2,	24.1,	1.5);
(547088.0,	4150574.0,	22.3,	1.5);	(547068.3,	4150601.0,	21.9,	1.5);
(547095.4,	4150602.8,	22.9,	1.5);	(547142.2,	4150609.0,	26.2,	1.5);
(547141.8,	4150592.0,	26.6,	1.5);	(547138.0,	4150577.8,	26.9,	1.5);
(547139.1,	4150563.3,	27.0,	1.5);	(547148.1,	4150532.0,	25.4,	1.5);
(547157.2,	4150517.0,	20.7,	1.5);	(547192.3,	4150515.5,	22.1,	1.5);

Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

```
( 547184.3, 4150532.5,      26.2,       1.5);        ( 547183.3, 4150566.0,      27.1,       1.5);
( 547182.2, 4150583.5,      27.2,       1.5);        ( 547165.7, 4150621.8,      31.3,       1.5);
( 547208.2, 4150740.0,      41.8,       1.5);        ( 547189.1, 4150757.5,      39.4,       1.5);
( 547175.2, 4150769.2,      38.9,       1.5);        ( 547172.6, 4150779.3,      38.8,       1.5);
( 547162.5, 4150790.5,      38.6,       1.5);        ( 547148.7, 4150808.8,      43.3,       1.5);
( 547141.8, 4150818.8,      44.1,       1.5);        ( 547129.0, 4150831.0,      44.5,       1.5);
( 547147.1, 4150866.8,      44.6,       1.5);        ( 547168.4, 4150835.2,      44.5,       1.5);
( 547179.0, 4150819.8,      44.2,       1.5);        ( 547188.1, 4150810.2,      44.2,       1.5);
( 547206.1, 4150798.0,      41.9,       1.5);        ( 547220.0, 4150779.3,      42.6,       1.5);
( 547233.8, 4150764.0,      43.2,       1.5);        ( 547240.8, 4150756.5,      43.4,       1.5);
( 547288.6, 4150783.5,      43.8,       1.5);        ( 547247.6, 4150820.8,      48.4,       1.5);
( 547234.3, 4150839.5,      48.8,       1.5);        ( 547216.8, 4150854.5,      48.2,       1.5);
( 547209.3, 4150863.0,      47.8,       1.5);        ( 547320.6, 4150807.5,      50.8,       1.5);
( 547306.2, 4150827.2,      50.8,       1.5);        ( 547285.9, 4150846.5,      49.0,       1.5);
( 547272.1, 4150856.5,      48.9,       1.5);        ( 547264.7, 4150871.5,      48.8,       1.5);
( 547249.2, 4150880.5,      48.7,       1.5);        ( 547230.1, 4150690.0,      36.9,       1.5);
( 547273.8, 4150723.5,      42.6,       1.5);        ( 547263.1, 4150728.2,      42.8,       1.5);
( 547282.3, 4150701.8,      37.6,       1.5);        ( 547332.8, 4150705.5,      41.1,       1.5);
( 547313.6, 4150735.8,      46.0,       1.5);        ( 547307.8, 4150746.2,      45.8,       1.5);
( 547307.8, 4150756.5,      45.8,       1.5);        ( 547328.0, 4150765.5,      47.1,       1.5);
( 547342.9, 4150775.8,      47.5,       1.5);        ( 547240.2, 4150608.5,      31.4,       1.5);
( 547253.0, 4150610.2,      31.6,       1.5);        ( 547265.2, 4150612.2,      31.8,       1.5);
( 547278.0, 4150612.2,      32.1,       1.5);        ( 547297.7, 4150612.8,      34.4,       1.5);
( 547298.8, 4150588.2,      34.2,       1.5);        ( 547298.8, 4150570.3,      34.0,       1.5);
( 547298.8, 4150553.8,      34.0,       1.5);        ( 547302.4, 4150524.0,      29.5,       1.5);
( 547302.4, 4150492.0,      29.2,       1.5);        ( 547290.2, 4150495.2,      28.3,       1.5);
( 547274.8, 4150495.2,      26.6,       1.5);        ( 547255.6, 4150495.2,      26.4,       1.5);
( 547251.9, 4150520.2,      26.2,       1.5);        ( 547250.8, 4150550.5,      31.7,       1.5);
( 547250.8, 4150570.3,      32.0,       1.5);        ( 547250.3, 4150591.0,      31.8,       1.5);
( 547190.7, 4150492.5,      22.0,       1.5);        ( 546889.5, 4150865.0,      30.8,       1.5);
( 546876.8, 4150872.0,      30.6,       1.5);        ( 546845.9, 4150883.8,      29.6,       1.5);
( 546834.1, 4150883.8,      27.4,       1.5);        ( 546613.8, 4150851.8,      14.9,       1.5);
( 546610.6, 4150860.2,      14.7,       1.5);        ( 546584.6, 4150857.0,      13.1,       1.5);
( 546595.1, 4150890.0,      18.8,       1.5);        ( 546592.0, 4150906.2,      19.5,       1.5);
( 546574.7, 4150929.8,      18.7,       1.5);        ( 546550.2, 4150914.5,      17.7,       1.5);
( 546535.9, 4150918.5,      17.7,       1.5);        ( 546511.5, 4150890.0,      15.6,       1.5);
( 546494.2, 4150890.0,      15.8,       1.5);        ( 546480.9, 4150954.2,      16.8,       1.5);
( 546491.1, 4150956.2,      17.0,       1.5);        ( 546514.6, 4150965.5,      17.5,       1.5);
( 546521.7, 4150970.5,      17.6,       1.5);        ( 546541.1, 4150985.8,      22.3,       1.5);
( 546532.9, 4151001.0,      23.3,       1.5);        ( 546525.8, 4151016.2,      23.6,       1.5);
( 546519.6, 4151032.8,      23.6,       1.5);        ( 546492.1, 4151016.2,      22.6,       1.5);
( 546479.9, 4151016.2,      21.6,       1.5);        ( 546465.6, 4151008.3,      21.4,       1.5);
( 546472.8, 4151052.0,      21.7,       1.5);        ( 546493.1, 4151072.5,      27.8,       1.5);
( 546486.0, 4151090.8,      28.3,       1.5);        ( 546622.6, 4151016.2,      27.0,       1.5);
( 546641.0, 4151018.5,      27.2,       1.5);        ( 546657.2, 4151029.5,      28.8,       1.5);
( 546638.9, 4151062.2,      27.6,       1.5);        ( 546629.8, 4151077.5,      31.5,       1.5);
( 546622.6, 4151088.8,      32.2,       1.5);        ( 546617.5, 4151098.0,      32.6,       1.5);
( 546574.7, 4151092.8,      30.8,       1.5);        ( 546595.1, 4151059.3,      26.2,       1.5);
( 546610.4, 4151040.8,      26.9,       1.5);        ( 546708.2, 4151019.5,      32.9,       1.5);
```

Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

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

(546719.5,	4151021.5,	33.2,	1.5);	(546732.8,	4151021.5,	34.4,	1.5);
(546780.6,	4151010.2,	37.6,	1.5);	(546799.0,	4151009.2,	37.4,	1.5);
(546808.2,	4151045.0,	38.1,	1.5);	(546803.1,	4151046.0,	37.9,	1.5);
(546786.8,	4151049.0,	37.7,	1.5);	(546768.4,	4151053.0,	37.5,	1.5);
(546749.1,	4151058.2,	35.7,	1.5);	(546735.8,	4151058.2,	34.6,	1.5);
(546717.4,	4151059.3,	33.3,	1.5);	(546841.8,	4151002.0,	41.0,	1.5);
(546852.0,	4150997.0,	41.2,	1.5);	(546867.3,	4150995.0,	41.5,	1.5);
(546878.5,	4150992.0,	41.4,	1.5);	(546886.7,	4150989.8,	41.3,	1.5);
(546897.9,	4150985.8,	41.0,	1.5);	(546905.0,	4150983.8,	41.0,	1.5);
(546924.4,	4150975.5,	37.6,	1.5);	(546942.8,	4150959.2,	40.2,	1.5);
(546949.9,	4150959.2,	40.6,	1.5);	(546976.4,	4150995.0,	46.6,	1.5);
(546942.8,	4151013.2,	46.0,	1.5);	(546922.4,	4151023.5,	43.2,	1.5);
(546901.9,	4151028.5,	42.9,	1.5);	(546881.6,	4151037.8,	43.0,	1.5);
(546865.3,	4151037.8,	42.8,	1.5);	(546859.1,	4151037.8,	42.6,	1.5);
(546961.1,	4151100.0,	51.8,	1.5);	(546969.2,	4151086.8,	51.5,	1.5);
(546977.4,	4151037.8,	47.9,	1.5);	(546956.0,	4151052.0,	47.0,	1.5);
(546932.6,	4151064.3,	45.7,	1.5);	(546903.0,	4151074.5,	46.0,	1.5);
(546879.5,	4151078.5,	46.0,	1.5);	(546859.1,	4151080.5,	45.8,	1.5);
(546810.2,	4151085.8,	42.2,	1.5);	(546795.9,	4151091.8,	42.1,	1.5);
(546781.7,	4151091.8,	42.1,	1.5);	(546747.0,	4151096.0,	40.5,	1.5);
(546678.7,	4151083.8,	36.4,	1.5);	(546697.1,	4151102.0,	37.8,	1.5);
(546691.9,	4151064.3,	32.4,	1.5);	(547561.8,	4150969.8,	58.9,	1.5);
(547077.8,	4150875.3,	40.1,	1.5);	(547061.8,	4150901.5,	44.7,	1.5);
(547047.1,	4150909.2,	44.8,	1.5);	(547010.1,	4150929.5,	42.1,	1.5);
(546990.9,	4150938.0,	42.0,	1.5);	(547023.5,	4150966.8,	44.0,	1.5);
(547066.9,	4150941.8,	46.0,	1.5);	(547078.4,	4150937.2,	46.0,	1.5);
(547100.1,	4150914.2,	46.9,	1.5);	(547113.5,	4150906.0,	48.8,	1.5);
(547143.5,	4150931.5,	50.9,	1.5);	(547119.2,	4150957.0,	50.0,	1.5);
(547087.3,	4150977.5,	46.6,	1.5);	(547071.4,	4150990.2,	50.7,	1.5);
(547044.6,	4151003.8,	50.9,	1.5);	(547027.9,	4151012.0,	50.0,	1.5);
(547012.6,	4151062.5,	48.4,	1.5);	(547005.6,	4151081.0,	51.8,	1.5);
(547004.9,	4151091.8,	52.4,	1.5);	(547042.6,	4151047.0,	51.3,	1.5);
(547082.9,	4151022.2,	52.2,	1.5);	(547106.5,	4151005.5,	54.0,	1.5);
(547116.1,	4150999.2,	55.5,	1.5);	(547125.0,	4150996.0,	55.7,	1.5);
(547137.8,	4150980.8,	54.2,	1.5);	(547163.3,	4150964.0,	50.6,	1.5);
(547172.9,	4150950.0,	50.8,	1.5);	(547209.9,	4150981.2,	57.9,	1.5);
(547186.9,	4150997.2,	56.4,	1.5);	(547143.5,	4151035.5,	57.9,	1.5);
(547118.0,	4151052.2,	56.5,	1.5);	(547109.0,	4151059.8,	54.7,	1.5);
(547078.4,	4151073.2,	55.7,	1.5);	(547119.2,	4151084.8,	63.1,	1.5);
(547139.1,	4151070.8,	62.0,	1.5);	(547158.2,	4151060.5,	57.2,	1.5);
(547197.1,	4151024.8,	57.7,	1.5);	(547210.6,	4151014.0,	59.1,	1.5);

Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

```
( 547231.0, 4151005.5,      59.4,       1.5);
( 547215.7, 4150908.0,      53.2,       1.5);
( 547197.1, 4150875.3,      45.8,       1.5);
( 547232.2, 4150950.8,      54.7,       1.5);
( 547278.2, 4150923.8,      54.6,       1.5);
( 547308.2, 4150893.8,      56.2,       1.5);
( 547345.9, 4150851.0,      52.8,       1.5);
( 547389.3, 4150863.8,      53.3,       1.5);
( 547351.7, 4150909.8,      58.0,       1.5);
( 547303.8, 4150955.2,      56.9,       1.5);
( 547386.1, 4150948.0,      59.3,       1.5);
( 547343.4, 4150989.0,      62.5,       1.5);
( 547312.1, 4151009.5,      62.6,       1.5);
( 547279.5, 4151038.2,      60.2,       1.5);
( 547246.9, 4151055.5,      59.9,       1.5);
( 547393.8, 4150991.0,      63.7,       1.5);
( 547370.2, 4151019.0,      64.7,       1.5);
( 547332.5, 4151044.5,      64.2,       1.5);
( 547300.6, 4151082.8,      75.5,       1.5);
( 547364.4, 4150739.2,      47.8,       1.5);
( 547405.9, 4150737.5,      49.2,       1.5);
( 547393.2, 4150773.8,      48.9,       1.5);
( 547420.0, 4150828.0,      53.7,       1.5);
( 547441.1, 4150783.5,      50.0,       1.5);
( 547451.2, 4150740.0,      49.9,       1.5);
( 546764.9, 4150908.0,      30.9,       1.5);
( 546720.2, 4150912.3,      27.0,       1.5);
( 546678.7, 4150918.0,      26.0,       1.5);
( 546754.7, 4150941.8,      31.5,       1.5);
( 546714.4, 4150945.0,      27.1,       1.5);
( 546808.3, 4150904.0,      31.1,       1.5);
( 546844.1, 4150922.5,      35.6,       1.5);
( 547358.1, 4150493.5,      31.9,       1.5);
( 547386.8, 4150498.0,      33.0,       1.5);
( 547386.1, 4150544.0,      37.8,       1.5);
( 547383.6, 4150581.8,      37.6,       1.5);
( 547372.1, 4150616.8,      36.9,       1.5);
( 547343.4, 4150617.5,      36.3,       1.5);
( 547332.5, 4150581.0,      36.3,       1.5);
( 547339.5, 4150508.8,      31.4,       1.5);
( 547421.3, 4150598.2,      39.5,       1.5);
( 547170.8, 4151096.8,      66.3,       1.5);
( 546989.8, 4150623.8,      22.7,       1.5);
( 546977.8, 4150670.5,      23.8,       1.5);
( 547059.9, 4150596.5,      21.7,       1.5);
( 547077.1, 4150588.5,      22.0,       1.5);
( 547205.4, 4150921.2,      53.3,       1.5);
( 547236.8, 4150898.2,      53.0,       1.5);
( 547180.6, 4150891.2,      49.2,       1.5);
( 547257.8, 4150927.8,      54.9,       1.5);
( 547296.8, 4150903.5,      56.2,       1.5);
( 547331.2, 4150874.0,      52.2,       1.5);
( 547356.8, 4150837.8,      52.9,       1.5);
( 547375.9, 4150887.5,      52.6,       1.5);
( 547327.4, 4150931.0,      58.1,       1.5);
( 547282.7, 4150973.8,      55.1,       1.5);
( 547367.0, 4150965.2,      58.8,       1.5);
( 547334.4, 4150993.5,      62.7,       1.5);
( 547293.6, 4151024.0,      61.5,       1.5);
( 547261.0, 4151052.2,      60.0,       1.5);
( 547235.4, 4151061.2,      59.8,       1.5);
( 547378.5, 4151005.5,      64.0,       1.5);
( 547352.3, 4151026.8,      64.9,       1.5);
( 547313.4, 4151066.3,      62.9,       1.5);
( 547373.4, 4150710.5,      46.0,       1.5);
( 547412.9, 4150709.2,      44.2,       1.5);
( 547398.2, 4150752.0,      49.0,       1.5);
( 547383.6, 4150798.0,      48.8,       1.5);
( 547438.5, 4150806.5,      53.0,       1.5);
( 547446.1, 4150759.2,      50.0,       1.5);
( 547446.8, 4150713.2,      48.8,       1.5);
( 546737.4, 4150912.3,      28.3,       1.5);
( 546697.2, 4150915.0,      26.6,       1.5);
( 546771.2, 4150935.2,      32.0,       1.5);
( 546731.1, 4150945.0,      28.3,       1.5);
( 546667.2, 4150946.8,      25.2,       1.5);
( 546817.2, 4150928.2,      32.3,       1.5);
( 546867.1, 4150919.5,      36.5,       1.5);
( 547368.9, 4150497.2,      32.0,       1.5);
( 547386.1, 4150530.0,      37.8,       1.5);
( 547385.5, 4150561.2,      37.6,       1.5);
( 547383.6, 4150616.0,      38.3,       1.5);
( 547361.9, 4150616.8,      36.7,       1.5);
( 547329.9, 4150617.5,      35.9,       1.5);
( 547340.8, 4150544.5,      36.1,       1.5);
( 547420.6, 4150544.5,      39.2,       1.5);
( 547418.7, 4150620.0,      43.2,       1.5);
( 546998.3, 4150613.0,      17.8,       1.5);
( 546965.7, 4150679.2,      23.2,       1.5);
( 547088.9, 4150564.5,      22.3,       1.5);
( 547081.4, 4150596.5,      22.2,       1.5);
```

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 *** ISCST3 - VERSION 02035 ***    *** FS 41 Res                                                            ***        09/19/16
                                   ***                                                                      ***        12:01:54
**MODELOPTs:                                                                                                           PAGE  88
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
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Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

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

FILE: ..\METDAT~1\3Years.asc
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 5905 UPPER AIR STATION NO.: 5905
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 2003 YEAR: 2003

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)
03	01	01	01	281.1	1.79	281.7	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	02	283.9	2.06	281.5	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	03	278.3	2.59	281.2	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	04	267.7	2.77	281.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	05	258.1	2.68	280.9	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	06	253.1	2.77	281.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	07	257.0	3.22	281.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	08	260.3	3.49	280.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	09	262.6	2.73	281.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	10	266.0	3.80	282.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	11	250.5	2.95	283.7	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	12	248.9	3.93	284.8	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	13	254.0	3.71	285.8	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	14	252.1	3.35	287.0	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	15	242.8	3.26	287.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	16	223.5	2.64	287.0	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	17	226.2	2.41	285.3	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	18	248.6	3.53	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	19	236.6	2.82	284.5	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	20	250.8	3.80	284.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	21	260.8	4.60	283.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	22	254.6	5.19	283.5	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	23	259.6	5.10	283.4	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	24	247.1	2.41	283.0	5	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 - Residential Receptors
Unit Emission Rates (1 g/s)

```
*** ISCST3 - VERSION 02035 ***    *** FS 41 Res                                                    ***        09/19/16
                                   ***                                                              ***        12:01:54
**MODELOPTs:                                                                                                  PAGE 100
CONC                    URBAN ELEV  FLGPOL DFAULT

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

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

                                                                                                      NETWORK
GROUP ID                       AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZFLAG)   OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

SRCGP1    1ST HIGHEST VALUE IS      33.39107 AT (  547088.94,  4150564.50,     22.27,      1.50)  DC       NA
          2ND HIGHEST VALUE IS      32.31483 AT (  547059.88,  4150596.50,     21.67,      1.50)  DC       NA
          3RD HIGHEST VALUE IS      30.76048 AT (  547088.00,  4150574.00,     22.28,      1.50)  DC       NA
          4TH HIGHEST VALUE IS      30.05725 AT (  547077.06,  4150588.50,     22.05,      1.50)  DC       NA
          5TH HIGHEST VALUE IS      27.02781 AT (  547068.31,  4150601.00,     21.85,      1.50)  DC       NA
          6TH HIGHEST VALUE IS      24.97113 AT (  547081.44,  4150596.50,     22.21,      1.50)  DC       NA
          7TH HIGHEST VALUE IS      18.94432 AT (  547095.44,  4150602.75,     22.89,      1.50)  DC       NA
          8TH HIGHEST VALUE IS      14.34400 AT (  546998.31,  4150613.00,     17.84,      1.50)  DC       NA
          9TH HIGHEST VALUE IS      13.18309 AT (  547007.62,  4150621.75,     22.83,      1.50)  DC       NA
         10TH HIGHEST VALUE IS      10.31846 AT (  547138.00,  4150577.75,     26.88,      1.50)  DC       NA

SRCGP2    1ST HIGHEST VALUE IS       6.13244 AT (  547088.94,  4150564.50,     22.27,      1.50)  DC       NA
          2ND HIGHEST VALUE IS       5.38941 AT (  547088.00,  4150574.00,     22.28,      1.50)  DC       NA
          3RD HIGHEST VALUE IS       4.68208 AT (  547077.06,  4150588.50,     22.05,      1.50)  DC       NA
          4TH HIGHEST VALUE IS       4.47617 AT (  547059.88,  4150596.50,     21.67,      1.50)  DC       NA
          5TH HIGHEST VALUE IS       4.17865 AT (  547148.12,  4150532.00,     25.40,      1.50)  DC       NA
          6TH HIGHEST VALUE IS       4.12988 AT (  547081.44,  4150596.50,     22.21,      1.50)  DC       NA
          7TH HIGHEST VALUE IS       4.07328 AT (  547068.31,  4150601.00,     21.85,      1.50)  DC       NA
          8TH HIGHEST VALUE IS       4.01304 AT (  547139.06,  4150563.25,     26.97,      1.50)  DC       NA
          9TH HIGHEST VALUE IS       3.62960 AT (  547095.44,  4150602.75,     22.89,      1.50)  DC       NA
         10TH HIGHEST VALUE IS       3.62231 AT (  547138.00,  4150577.75,     26.88,      1.50)  DC       NA


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

Residential MER Location

Model Output - Residential Receptors
Unit Emission Rates (1 g/s)

*** 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   209 Informational Message(s)

A Total of   209 Calm Hours Identified

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

   ********   WARNING MESSAGES   ********
RE W282 4370 CHK_EL:RecElev < SrcBase; See non-DFAULT HE>ZI option in MCB#9

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

Model Output - School Receptors
Unit Emission Rates (1 g/s)

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: 80 Source(s);   2 Source Group(s); and   46 Receptor(s)

**The Model Assumes A Pollutant Type of: PM

**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 - School Receptors
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 =     1.4 MB of RAM.

**Input Runstream File:          FS41School.INP
**Output Print File:             FS41School.OUT
**Detailed Error/Message File:   FS41SC~1.ERR
```

Model Output - School Receptors
Unit Emission Rates (1 g/s)

*** 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	0.12658E-01	546961.6	4150580.5	17.1	0.00	4.53	1.93	SHRDOW
L0000002	0	0.12658E-01	546969.6	4150575.0	17.5	0.00	4.53	1.93	SHRDOW
L0000003	0	0.12658E-01	546977.8	4150569.5	17.8	0.00	4.53	1.93	SHRDOW
L0000004	0	0.12658E-01	546985.8	4150564.0	18.0	0.00	4.53	1.93	SHRDOW
L0000005	0	0.12658E-01	546993.9	4150558.8	18.0	0.00	4.53	1.93	SHRDOW
L0000006	0	0.12658E-01	547002.0	4150553.2	17.9	0.00	4.53	1.93	SHRDOW
L0000007	0	0.12658E-01	547010.1	4150547.8	17.8	0.00	4.53	1.93	SHRDOW
L0000008	0	0.12658E-01	547018.2	4150542.2	17.9	0.00	4.53	1.93	SHRDOW
L0000009	0	0.12658E-01	547026.2	4150537.0	19.6	0.00	4.53	1.93	SHRDOW
L0000010	0	0.12658E-01	547034.4	4150531.5	19.8	0.00	4.53	1.93	SHRDOW
L0000011	0	0.12658E-01	547042.4	4150526.0	15.0	0.00	4.53	1.93	SHRDOW
L0000012	0	0.12658E-01	547050.6	4150520.5	15.3	0.00	4.53	1.93	SHRDOW
L0000013	0	0.12658E-01	547058.6	4150515.2	15.6	0.00	4.53	1.93	SHRDOW
L0000014	0	0.12658E-01	547066.8	4150509.8	15.8	0.00	4.53	1.93	SHRDOW
L0000015	0	0.12658E-01	547074.8	4150504.2	16.0	0.00	4.53	1.93	SHRDOW
L0000016	0	0.12658E-01	547082.9	4150498.8	16.2	0.00	4.53	1.93	SHRDOW
L0000017	0	0.12658E-01	547086.4	4150492.2	16.3	0.00	4.53	1.93	SHRDOW
L0000018	0	0.12658E-01	547081.9	4150483.5	16.1	0.00	4.53	1.93	SHRDOW
L0000019	0	0.12658E-01	547077.4	4150475.0	16.0	0.00	4.53	1.93	SHRDOW
L0000020	0	0.12658E-01	547072.9	4150466.2	16.0	0.00	4.53	1.93	SHRDOW
L0000021	0	0.12658E-01	547067.6	4150459.8	15.9	0.00	4.53	1.93	SHRDOW
L0000022	0	0.12658E-01	547058.9	4150464.0	15.8	0.00	4.53	1.93	SHRDOW
L0000023	0	0.12658E-01	547050.1	4150468.3	15.6	0.00	4.53	1.93	SHRDOW
L0000024	0	0.12658E-01	547041.3	4150472.5	15.1	0.00	4.53	1.93	SHRDOW
L0000025	0	0.12658E-01	547032.5	4150476.8	14.3	0.00	4.53	1.93	SHRDOW
L0000026	0	0.12658E-01	547023.8	4150481.0	13.5	0.00	4.53	1.93	SHRDOW
L0000027	0	0.12658E-01	547014.9	4150485.2	12.2	0.00	4.53	1.93	SHRDOW
L0000028	0	0.12658E-01	547006.1	4150489.5	12.0	0.00	4.53	1.93	SHRDOW
L0000029	0	0.12658E-01	546997.4	4150493.5	11.9	0.00	4.53	1.93	SHRDOW
L0000030	0	0.12658E-01	546988.6	4150497.8	11.8	0.00	4.53	1.93	SHRDOW
L0000031	0	0.12658E-01	546979.8	4150502.0	11.6	0.00	4.53	1.93	SHRDOW
L0000032	0	0.12658E-01	546971.0	4150506.3	11.2	0.00	4.53	1.93	SHRDOW
L0000033	0	0.12658E-01	546962.2	4150510.5	10.7	0.00	4.53	1.93	SHRDOW
L0000034	0	0.12658E-01	546953.4	4150514.8	10.2	0.00	4.53	1.93	SHRDOW
L0000035	0	0.12658E-01	546944.6	4150519.0	9.6	0.00	4.53	1.93	SHRDOW
L0000036	0	0.12658E-01	546935.9	4150523.2	9.1	0.00	4.53	1.93	SHRDOW
L0000037	0	0.12658E-01	546927.1	4150527.5	6.5	0.00	4.53	1.93	SHRDOW

Model Output - School Receptors
Unit Emission Rates (1 g/s)

L0000038	0	0.12658E-01	546918.3	4150531.8	10.9	0.00	4.53	1.93	SHRDOW
L0000039	0	0.12658E-01	546909.5	4150535.8	10.9	0.00	4.53	1.93	SHRDOW
L0000040	0	0.12658E-01	546900.7	4150540.0	11.1	0.00	4.53	1.93	SHRDOW
L0000041	0	0.12658E-01	546891.9	4150544.3	11.4	0.00	4.53	1.93	SHRDOW
L0000042	0	0.12658E-01	546883.1	4150548.5	11.7	0.00	4.53	1.93	SHRDOW
L0000043	0	0.12658E-01	546874.4	4150552.8	11.7	0.00	4.53	1.93	SHRDOW
L0000044	0	0.12658E-01	546865.6	4150557.0	11.6	0.00	4.53	1.93	SHRDOW
L0000045	0	0.12658E-01	546856.8	4150561.2	11.2	0.00	4.53	1.93	SHRDOW
L0000046	0	0.12658E-01	546848.0	4150565.5	10.7	0.00	4.53	1.93	SHRDOW
L0000047	0	0.12658E-01	546839.2	4150569.8	8.9	0.00	4.53	1.93	SHRDOW
L0000048	0	0.12658E-01	546830.4	4150574.0	7.9	0.00	4.53	1.93	SHRDOW
L0000049	0	0.12658E-01	546821.6	4150578.0	7.1	0.00	4.53	1.93	SHRDOW
L0000050	0	0.12658E-01	546812.9	4150582.2	6.5	0.00	4.53	1.93	SHRDOW
L0000051	0	0.12658E-01	546804.1	4150586.5	6.1	0.00	4.53	1.93	SHRDOW
L0000052	0	0.12658E-01	546795.2	4150590.8	5.9	0.00	4.53	1.93	SHRDOW
L0000053	0	0.12658E-01	546786.5	4150595.0	5.8	0.00	4.53	1.93	SHRDOW
L0000054	0	0.12658E-01	546777.7	4150599.2	5.6	0.00	4.53	1.93	SHRDOW
L0000055	0	0.12658E-01	546768.9	4150603.5	5.4	0.00	4.53	1.93	SHRDOW
L0000056	0	0.12658E-01	546760.1	4150607.8	5.1	0.00	4.53	1.93	SHRDOW
L0000057	0	0.12658E-01	546751.4	4150612.0	4.8	0.00	4.53	1.93	SHRDOW
L0000058	0	0.12658E-01	546742.6	4150616.2	3.5	0.00	4.53	1.93	SHRDOW
L0000059	0	0.12658E-01	546733.8	4150620.2	8.0	0.00	4.53	1.93	SHRDOW
L0000060	0	0.12658E-01	546725.0	4150624.5	7.7	0.00	4.53	1.93	SHRDOW
L0000061	0	0.12658E-01	546716.2	4150628.8	7.6	0.00	4.53	1.93	SHRDOW
L0000062	0	0.12658E-01	546707.4	4150633.0	7.6	0.00	4.53	1.93	SHRDOW
L0000063	0	0.12658E-01	546698.6	4150637.2	7.6	0.00	4.53	1.93	SHRDOW
L0000064	0	0.12658E-01	546689.8	4150641.5	7.6	0.00	4.53	1.93	SHRDOW
L0000065	0	0.12658E-01	546681.1	4150645.8	7.4	0.00	4.53	1.93	SHRDOW
L0000066	0	0.12658E-01	546672.3	4150650.0	6.8	0.00	4.53	1.93	SHRDOW
L0000067	0	0.12658E-01	546663.5	4150654.2	5.9	0.00	4.53	1.93	SHRDOW
L0000068	0	0.12658E-01	546654.7	4150658.5	4.1	0.00	4.53	1.93	SHRDOW
L0000069	0	0.12658E-01	546645.9	4150662.5	3.4	0.00	4.53	1.93	SHRDOW
L0000070	0	0.12658E-01	546637.1	4150666.8	3.1	0.00	4.53	1.93	SHRDOW
L0000071	0	0.12658E-01	546628.3	4150671.0	3.0	0.00	4.53	1.93	SHRDOW
L0000072	0	0.12658E-01	546619.6	4150675.2	3.0	0.00	4.53	1.93	SHRDOW
L0000073	0	0.12658E-01	546610.8	4150679.5	2.8	0.00	4.53	1.93	SHRDOW
L0000074	0	0.12658E-01	546602.0	4150683.8	2.5	0.00	4.53	1.93	SHRDOW
L0000075	0	0.12658E-01	546593.2	4150688.0	2.2	0.00	4.53	1.93	SHRDOW
L0000076	0	0.12658E-01	546584.4	4150692.2	1.8	0.00	4.53	1.93	SHRDOW
L0000077	0	0.12658E-01	546575.6	4150696.5	1.5	0.00	4.53	1.93	SHRDOW
L0000078	0	0.12658E-01	546566.8	4150700.8	0.8	0.00	4.53	1.93	SHRDOW
L0000079	0	0.12658E-01	546558.1	4150705.0	0.7	0.00	4.53	1.93	SHRDOW

Model Output - School Receptors
Unit Emission Rates (1 g/s)

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	0.33834E-03	547074.8	4150547.2	21.8	4.15	5	1.93	SHRDOW

Model Output - School Receptors
Unit Emission Rates (1 g/s)

**MODELOPTs:
CONC URBAN ELEV FLGPOL DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID SOURCE IDs

SRCGP1 PAREA1 ,

SRCGP2 L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007, L0000008, L0000009, L0000010, L0000011, L0000012,
L0000013, L0000014, L0000015, L0000016, L0000017, 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, L0000052, L0000053, L0000054, L0000055, L0000056, L0000057, L0000058, L0000059, L0000060,
L0000061, L0000062, L0000063, L0000064, L0000065, L0000066, L0000067, L0000068, L0000069, L0000070, L0000071, L0000072,
L0000073, L0000074, L0000075, L0000076, L0000077, L0000078, L0000079,

Model Output - School Receptors
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 ; SOURCE ID = L0000001 through L0000079; 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 and 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 = SATURDAY and 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 = SATURDAY and 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 = FALL ; DAY OF WEEK = SATURDAY and 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 - School Receptors
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

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

(547125.4,	4150482.8,	20.6,	1.5);	(547129.0,	4150493.0,	20.5,	1.5);
(547135.2,	4150489.0,	20.8,	1.5);	(547133.0,	4150482.0,	20.9,	1.5);
(547149.5,	4150470.8,	20.9,	1.5);	(547158.0,	4150465.5,	20.8,	1.5);
(547167.3,	4150459.2,	20.8,	1.5);	(547297.9,	4150416.0,	25.0,	1.5);
(547308.2,	4150410.2,	25.6,	1.5);	(547343.0,	4150441.5,	30.8,	1.5);
(547355.9,	4150441.8,	31.1,	1.5);	(547368.4,	4150442.2,	31.3,	1.5);
(547382.7,	4150442.2,	32.8,	1.5);	(547381.3,	4150452.5,	32.7,	1.5);
(547366.2,	4150450.8,	31.6,	1.5);	(547352.4,	4150450.8,	31.4,	1.5);
(547343.4,	4150449.0,	31.1,	1.5);	(547358.6,	4150466.2,	31.9,	1.5);
(547381.3,	4150470.2,	32.4,	1.5);	(547409.0,	4150464.5,	34.1,	1.5);
(547420.6,	4150464.5,	34.7,	1.5);	(547433.1,	4150466.2,	34.9,	1.5);
(547397.8,	4150377.2,	29.3,	1.5);	(547390.7,	4150371.0,	28.9,	1.5);
(547380.9,	4150389.2,	28.4,	1.5);	(547376.4,	4150382.5,	28.0,	1.5);
(547373.3,	4150375.5,	27.9,	1.5);	(547367.9,	4150367.8,	27.8,	1.5);
(547364.8,	4150395.0,	28.0,	1.5);	(547357.2,	4150382.0,	28.0,	1.5);
(547347.9,	4150405.2,	27.7,	1.5);	(547339.9,	4150394.2,	27.6,	1.5);
(547331.8,	4150400.2,	27.1,	1.5);	(547338.1,	4150410.2,	27.3,	1.5);
(547384.9,	4150414.2,	29.0,	1.5);	(547118.0,	4150499.5,	19.8,	1.5);
(547114.4,	4150493.2,	19.6,	1.5);	(547111.8,	4150486.2,	19.5,	1.5);
(547310.6,	4150436.8,	25.9,	1.5);	(547307.7,	4150430.0,	25.7,	1.5);
(547352.5,	4150422.8,	27.5,	1.5);	(547430.1,	4150447.5,	34.3,	1.5);
(547431.4,	4150435.0,	30.5,	1.5);	(547432.1,	4150423.0,	30.6,	1.5);
(547432.1,	4150407.8,	30.8,	1.5);	(547434.0,	4150395.5,	30.9,	1.5);

```
 *** ISCST3 - VERSION 02035 ***    *** FS 41 Res                                                              ***        09/19/16
                                   ***                                                                        ***        12:15:58
**MODELOPTs:                                                                                                             PAGE  87
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 Output - School Receptors
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

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

FILE: ..\METDAT~1\3Years.asc
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 5905 UPPER AIR STATION NO.: 5905
NAME: UNKNOWN NAME: UNKNOWN
YEAR: 2003 YEAR: 2003

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)
03	01	01	01	281.1	1.79	281.7	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	02	283.9	2.06	281.5	5	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	03	278.3	2.59	281.2	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	04	267.7	2.77	281.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	05	258.1	2.68	280.9	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	06	253.1	2.77	281.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	07	257.0	3.22	281.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	08	260.3	3.49	280.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	09	262.6	2.73	281.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	10	266.0	3.80	282.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	11	250.5	2.95	283.7	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	12	248.9	3.93	284.8	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	13	254.0	3.71	285.8	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	14	252.1	3.35	287.0	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	15	242.8	3.26	287.5	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	16	223.5	2.64	287.0	2	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	17	226.2	2.41	285.3	3	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	18	248.6	3.53	285.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	19	236.6	2.82	284.5	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	20	250.8	3.80	284.0	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	21	260.8	4.60	283.8	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	22	254.6	5.19	283.5	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	23	259.6	5.10	283.4	4	300.0	300.0	0.0000	0.0	0.0000	0	0.00
03	01	01	24	247.1	2.41	283.0	5	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 - School Receptors
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** THE ANNUAL (3 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: SRCGP1 ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

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

X-COORD (M)	Y-COORD (M)	CONC		X-COORD (M)	Y-COORD (M)	CONC
547125.44	4150482.75	2.49342		547129.00	4150493.00	3.21147
547135.25	4150489.00	2.85920		547133.00	4150482.00	2.42861
547149.50	4150470.75	1.86137		547158.00	4150465.50	1.66221
547167.31	4150459.25	1.46614		547297.94	4150416.00	0.64861
547308.19	4150410.25	0.60228		547343.00	4150441.50	0.65279
547355.94	4150441.75	0.61759		547368.38	4150442.25	0.58614
547382.69	4150442.25	0.55092		547381.31	4150452.50	0.57381
547366.19	4150450.75	0.61099		547352.38	4150450.75	0.65121
547343.44	4150449.00	0.67391		547358.56	4150466.25	0.66863
547381.31	4150470.25	0.60613		547409.00	4150464.50	0.52499
547420.56	4150464.50	0.49903		547433.06	4150466.25	0.47511
547397.81	4150377.25	0.38669		547390.69	4150371.00	0.37817
547380.88	4150389.25	0.43241		547376.44	4150382.50	0.41924
547373.31	4150375.50	0.40315		547367.94	4150367.75	0.38596
547364.81	4150395.00	0.46690		547357.25	4150382.00	0.43532
547347.88	4150405.25	0.52225		547339.88	4150394.25	0.49348
547331.81	4150400.25	0.52573		547338.06	4150410.25	0.55545
547384.88	4150414.25	0.48780		547118.00	4150499.50	3.95663
547114.44	4150493.25	3.32274		547111.75	4150486.25	2.75098
547310.62	4150436.75	0.72852	Elementary School MER	547307.69	4150430.00	0.70324
547352.50	4150422.75	0.57147		547430.12	4150447.50	0.45845
547431.44	4150435.00	0.44071		547432.06	4150423.00	0.42435
547432.06	4150407.75	0.40337		547434.00	4150395.50	0.38271

Model Output - School Receptors
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

*** THE ANNUAL (3 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: SRCGP2 ***
INCLUDING SOURCE(S): L0000001, L0000002, L0000003, L0000004, L0000005, L0000006, L0000007,
L0000008, L0000009, L0000010, L0000011, L0000012, L0000013, L0000014, L0000015, L0000016, L0000017, L0000018, L0000019,
L0000020, L0000021, L0000022, L0000023, L0000024, L0000025, L0000026, L0000027, L0000028, L0000029, L0000030, . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

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

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
547125.44	4150482.75	5.44506	547129.00	4150493.00	5.61319
547135.25	4150489.00	4.64557	547133.00	4150482.00	4.50329
547149.50	4150470.75	2.85439	547158.00	4150465.50	2.36661
547167.31	4150459.25	1.96249	547297.94	4150416.00	0.56189
547308.19	4150410.25	0.52109	547343.00	4150441.50	0.49065
547355.94	4150441.75	0.46096	547368.38	4150442.25	0.43531
547382.69	4150442.25	0.40789	547381.31	4150452.50	0.42113
547366.19	4150450.75	0.44985	547352.38	4150450.75	0.48100
547343.44	4150449.00	0.50051	547358.56	4150466.25	0.48635
547381.31	4150470.25	0.43986	547409.00	4150464.50	0.38306
547420.56	4150464.50	0.36465	547433.06	4150466.25	0.34758
547397.81	4150377.25	0.32053	547390.69	4150371.00	0.32186
547380.88	4150389.25	0.35424	547376.44	4150382.50	0.35220
547373.31	4150375.50	0.34744	547367.94	4150367.75	0.34358
547364.81	4150395.00	0.38430	547357.25	4150382.00	0.37754
547347.88	4150405.25	0.42704	547339.88	4150394.25	0.42400
547331.81	4150400.25	0.44921	547338.06	4150410.25	0.45384
547384.88	4150414.25	0.37540	547118.00	4150499.50	8.03235
547114.44	4150493.25	8.65027	547111.75	4150486.25	8.61765
547310.62	4150436.75	0.57128	547307.69	4150430.00	0.56601
547352.50	4150422.75	0.44300	547430.12	4150447.50	0.33804
547431.44	4150435.00	0.32731	547432.06	4150423.00	0.31799
547432.06	4150407.75	0.30715	547434.00	4150395.50	0.29630

Elementary School MER

Model Output - School Receptors
Unit Emission Rates (1 g/s)

CONC URBAN ELEV FLGPOL DFAULT

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

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

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID	
SRCGP1	1ST HIGHEST VALUE IS	3.95663 AT (547118.00, 4150499.50, 19.81, 1.50)	DC	NA	K-8 School MER
	2ND HIGHEST VALUE IS	3.32274 AT (547114.44, 4150493.25, 19.64, 1.50)	DC	NA	
	3RD HIGHEST VALUE IS	3.21147 AT (547129.00, 4150493.00, 20.52, 1.50)	DC	NA	
	4TH HIGHEST VALUE IS	2.85920 AT (547135.25, 4150489.00, 20.78, 1.50)	DC	NA	
	5TH HIGHEST VALUE IS	2.75098 AT (547111.75, 4150486.25, 19.47, 1.50)	DC	NA	
	6TH HIGHEST VALUE IS	2.49342 AT (547125.44, 4150482.75, 20.58, 1.50)	DC	NA	
	7TH HIGHEST VALUE IS	2.42861 AT (547133.00, 4150482.00, 20.87, 1.50)	DC	NA	
	8TH HIGHEST VALUE IS	1.86137 AT (547149.50, 4150470.75, 20.94, 1.50)	DC	NA	
	9TH HIGHEST VALUE IS	1.66221 AT (547158.00, 4150465.50, 20.82, 1.50)	DC	NA	
	10TH HIGHEST VALUE IS	1.46614 AT (547167.31, 4150459.25, 20.75, 1.50)	DC	NA	
SRCGP2	1ST HIGHEST VALUE IS	8.65027 AT (547114.44, 4150493.25, 19.64, 1.50)	DC	NA	
	2ND HIGHEST VALUE IS	8.61765 AT (547111.75, 4150486.25, 19.47, 1.50)	DC	NA	
	3RD HIGHEST VALUE IS	8.03235 AT (547118.00, 4150499.50, 19.81, 1.50)	DC	NA	K-8 School MER
	4TH HIGHEST VALUE IS	5.61319 AT (547129.00, 4150493.00, 20.52, 1.50)	DC	NA	
	5TH HIGHEST VALUE IS	5.44506 AT (547125.44, 4150482.75, 20.58, 1.50)	DC	NA	
	6TH HIGHEST VALUE IS	4.64557 AT (547135.25, 4150489.00, 20.78, 1.50)	DC	NA	
	7TH HIGHEST VALUE IS	4.50329 AT (547133.00, 4150482.00, 20.87, 1.50)	DC	NA	
	8TH HIGHEST VALUE IS	2.85439 AT (547149.50, 4150470.75, 20.94, 1.50)	DC	NA	
	9TH HIGHEST VALUE IS	2.36661 AT (547158.00, 4150465.50, 20.82, 1.50)	DC	NA	
	10TH HIGHEST VALUE IS	1.96249 AT (547167.31, 4150459.25, 20.75, 1.50)	DC	NA	

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

Model Output - School Receptors
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 1 Warning Message(s)
A Total of 209 Informational Message(s)

A Total of 209 Calm Hours Identified

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

******** WARNING MESSAGES ********
RE W282 4164 CHK_EL:RecElev < SrcBase; See non-DFAULT HE>ZI option in MCB#9

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

Appendix C. Construction Risk Calculations

Table C1a
MER Concentrations for Risk Calculations

Residential Receptors - Unmitigated				
Emission Source	Model Output [1] ($\mu g/m^3$)	Pollutant	Emission Rates [2] (g/s)	MER Concentrations ($\mu g/m^3$)
(a)	(b)	(c)	(d)	(f)
	Annual Average		Average Daily	Annual Average
2016 On-site	33.39	DPM	1.81E-02	**6.05E-01**
		$PM_{2.5}$	1.71E-02	**5.70E-01**
2016 Off-site	6.13	DPM	3.54E-05	**2.17E-04**
		$PM_{2.5}$	3.27E-05	**2.00E-04**
2017 On-site	33.39	DPM	1.74E-02	**5.80E-01**
		$PM_{2.5}$	1.69E-02	**5.63E-01**
2017 Off-site	6.13	DPM	1.01E-05	**6.21E-05**
		$PM_{2.5}$	9.29E-06	**5.70E-05**
Residential Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP				
Source	Model Output [1] ($\mu g/m^3$)	Pollutant	Emission Rates [2] (g/s)	Mass GLC ($\mu g/m^3$)
(a)	(c)	(b)	(d)	(f)
	Annual Average		Average Daily	Annual Average
2016 On-site	33.39	DPM	1.18E-03	**3.93E-02**
		$PM_{2.5}$	1.18E-03	**3.93E-02**
2016 Off-site	6.13	DPM	3.54E-05	**2.17E-04**
		$PM_{2.5}$	3.27E-05	**2.00E-04**
2017 On-site	33.39	DPM	1.84E-03	**6.16E-02**
		$PM_{2.5}$	1.84E-03	**6.16E-02**
2017 Off-site	6.13	DPM	1.01E-05	**6.21E-05**
		$PM_{2.5}$	9.29E-06	**5.70E-05**

Maximum Exposed Receptor (MER) UTM coordinates: 547088.94E, 4150564.50N

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

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

Table C1b
Quantification of Carcinogenic Risks for Off-site 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)	Carcinogenic Risks (by age bin) 3rd Trimester per million	Carcinogenic Risks (by age bin) 0 < 2 years per million	**Total Risk** per million
(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(k)	(l)	(o)
Residential Receptors - Unmitigated											
2016	On-Site Emissions	6.05E-01	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	2.09E-04	6.3E-04	6.14E+00		6.14
	Truck Route	2.17E-04	1.00E+00		3.0E-04	1.1E+00	7.52E-08	2.3E-07	2.20E-03		0.00
2017	On-Site Emissions	5.80E-01	1.00E+00		3.0E-04	1.1E+00	2.01E-04	6.1E-04	5.15E-01	7.43E+01	74.8
	Truck Route	6.21E-05	1.00E+00		3.0E-04	1.1E+00	2.15E-08	6.5E-08	5.52E-05	7.95E-03	0.01
									Total Cancer Risk		**81.0**
Residential Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP											
2016	On-Site Emissions	3.93E-02	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	1.4E-05	4.1E-05	3.98E-01		0.40
	Truck Route	2.17E-04	1.00E+00		3.0E-04	1.1E+00	7.5E-08	2.3E-07	2.20E-03		0.00
2017	On-Site Emissions	6.16E-02	1.00E+00		3.0E-04	1.1E+00	2.1E-05	6.4E-05	5.47E-02	7.88E+00	7.94
	Truck Route	6.21E-05	1.00E+00		3.0E-04	1.1E+00	2.2E-08	6.5E-08	5.52E-05	7.95E-03	0.01
									Total Cancer Risk		**8.35**

Maximum Exposed Receptor (MER) UTM coordinates: 547088.94E, 4150564.50N

		OEHHA age bin	3rd Trimester	0 < 2 years
		exposure year(s)	2016-2017	2017
Dose Exposure Factors:		exposure frequency (days/year)	350	350
		inhalation rate (L/kg-day) [1]	361	1090
		inhalation absorption factor	1	1
Risk Calculation Factors:		age sensitivity factor	10	10
		averaging time (years)	70	70
		fraction of time at home	0.85	0.85

exposure durations per age bin			exposure durations (year)	
	Construction Year	Risk Scalar [2]	3rd Trimester	0 < 2 years
	2016	0.23	0.23	
	2017	0.98	0.02	0.96
	Total	1.21	0.25	0.96

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

[2] 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 C1c
Quantification of Non-Carcinogenic Risks
Chronic Hazards for Off-site 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)
Residential Receptors - Unmitigated														
2016	On-Site Emissions	Chronic	6.05E-01	1.00E+00	Diesel Particulate	5.0E+00	1.2E-01							
	Truck Route		2.17E-04	1.00E+00		5.0E+00	4.3E-05							
2017	On-Site Emissions		5.80E-01	1.00E+00		5.0E+00	1.2E-01							
	Truck Route		6.21E-05	1.00E+00		5.0E+00	1.2E-05							
TOTAL							2.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
					Maximum Chronic Hazard		**0.237**							
Residential Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP														
2016	On-Site Emissions	Chronic	3.93E-02	1.00E+00	Diesel Particulate	5.0E+00	7.9E-03							
	Truck Route		2.17E-04	1.00E+00		5.0E+00	4.3E-05							
2017	On-Site Emissions		6.16E-02	1.00E+00		5.0E+00	1.2E-02							
	Truck Route		6.21E-05	1.00E+00		5.0E+00	1.2E-05							
TOTAL							2.0E-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		**0.020**							

Maximum Exposed Receptor (MER) UTM coordinates: 547088.94E, 4150564.50N

* 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 C1d
PM2.5 Concentrations at Off-Site Residents

Contaminant (a)	Source (b)		MER Conc. ($\mu g/m^3$) (c)	Concentration Annual Average ($\mu g/m^3$) (d)
Residential Receptors - Unmitigated				
$PM_{2.5}$	2016	On-Site Emissions	5.70E-01	0.57
		Truck Route	2.00E-04	
	2017	On-Site Emissions	5.63E-01	0.56
		Truck Route	5.70E-05	
	Maximum Annual $PM_{2.5}$ Concentration			**0.57**
Residential Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP				
$PM_{2.5}$	2016	On-Site Emissions	3.93E-02	0.04
		Truck Route	2.00E-04	
	2017	On-Site Emissions	6.16E-02	0.06
		Truck Route	5.70E-05	
	Maximum Annual $PM_{2.5}$ Concentration			**0.06**

Maximum Exposed Receptor (MER) UTM coordinates: 547088.94E, 4150564.50N

Table C2a
Off-site K-8 Students - Concentrations for Risk Calculations

K-8 School Receptors - Unmitigated				
Emission Source	Model Output [1] ($\mu g/m^3$)	Pollutant	Emission Rates [2] (g/s)	MER Concentrations ($\mu g/m^3$)
(a)	(b)	(c)	(d)	(f)
	Annual Average		Average Daily	Annual Average
2016 On-site	3.96	DPM	1.81E-02	**7.17E-02**
		$PM_{2.5}$	1.71E-02	**6.76E-02**
2016 Off-site	8.03	DPM	3.54E-05	**2.84E-04**
		$PM_{2.5}$	3.27E-05	**2.63E-04**
2017 On-site	3.96	DPM	1.74E-02	**6.88E-02**
		$PM_{2.5}$	1.69E-02	**6.68E-02**
2017 Off-site	8.03	DPM	1.01E-05	**8.14E-05**
		$PM_{2.5}$	9.29E-06	**7.46E-05**
K-8 School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP				
Source	Model Output [1] ($\mu g/m^3$)	Pollutant	Emission Rates [2] (g/s)	Mass GLC ($\mu g/m^3$)
(a)	(c)	(b)	(d)	(f)
	Annual Average		Average Daily	Annual Average
2016 On-site	3.96	DPM	1.18E-03	**4.65E-03**
		$PM_{2.5}$	1.18E-03	**4.65E-03**
2016 Off-site	8.03	DPM	3.54E-05	**2.84E-04**
		$PM_{2.5}$	3.27E-05	**2.63E-04**
2017 On-site	3.96	DPM	1.84E-03	**7.30E-03**
		$PM_{2.5}$	1.84E-03	**7.30E-03**
2017 Off-site	8.03	DPM	1.01E-05	**8.14E-05**
		$PM_{2.5}$	9.29E-06	**7.46E-05**

Maximum Exposed Receptor (MER) UTM coordinates: 547118.00E, 4150499.5N

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

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

Table C2b
Quantification of Carcinogenic Risks
for Off-site K-8 Students

	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) 2 < 16 years (mg/kg-day)	Carcinogenic Risks (by age bin) 2 < 16 years per million	**Total Risk** per million
	(a)	(b)	(c)	(d)	(e)	(f)	(i)	(m)	(o)
K-8 School Receptors - Unmitigated									
2016	On-Site Emissions	7.17E-02	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	1.8E-05	1.90E-01	0.19
	Truck Route	2.84E-04	1.00E+00		3.0E-04	1.1E+00	7.3E-08	7.54E-04	0.00
2017	On-Site Emissions	6.88E-02	1.00E+00		3.0E-04	1.1E+00	1.8E-05	7.78E-01	0.78
	Truck Route	8.14E-05	1.00E+00		3.0E-04	1.1E+00	2.1E-08	9.21E-04	0.00
								Total Cancer Risk	**1.0**
K-8 School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP									
2016	On-Site Emissions	4.65E-03	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	1.2E-06	1.23E-02	0.01
	Truck Route	2.84E-04	1.00E+00		3.0E-04	1.1E+00	7.3E-08	7.54E-04	0.00
2017	On-Site Emissions	7.30E-03	1.00E+00		3.0E-04	1.1E+00	1.9E-06	8.26E-02	0.08
	Truck Route	8.14E-05	1.00E+00		3.0E-04	1.1E+00	2.1E-08	9.21E-04	0.00
								Total Cancer Risk	**0.10**

Maximum Exposed Receptor (MER) UTM coordinates: 547118.00E, 4150499.5N

	OEHHA age bin	2 < 16 years
	exposure year(s)	2016-2017
Dose Exposure Factors:	exposure frequency (days/year)[1]	180
	inhalation rate (L/kg-day) [2]	520
	inhalation absorption factor	1
Risk Calculation Factors:	age sensitivity factor	3
	averaging time (years)	70

exposure durations per age bin		exposure durations (year)
Construction Year	Risk Scalar [3]	2 < 16 years
2016	0.23	0.23
2017	0.98	0.98

[1] Office of Environmental Health Hazard Assessment. *Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites* . Dated February, 2004..

[2] Inhalation rate taken as the 95th percentile 8-hour breathing rates for moderate intensity activities (OEHHA, 2015).

[3] Risk scalars determined for each year of construction to adjust receptor exposures to the exposure durations for each construction year (see App A - Construction

Table C2c
Quantification of Non-Carcinogenic Risks
Chronic Hazards for Off-site K-8 Students

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)
K-8 School Receptors - Unmitigated														
2016	On-Site Emissions	Chronic	7.17E-02	1.00E+00	Diesel Particulate	5.0E+00	1.4E-02							
	Truck Route		2.84E-04	1.00E+00		5.0E+00	5.7E-05							
2017	On-Site Emissions		6.88E-02	1.00E+00		5.0E+00	1.4E-02							
	Truck Route		8.14E-05	1.00E+00		5.0E+00	1.6E-05							
TOTAL							2.8E-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		**0.028**							
K-8 School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP														
2016	On-Site Emissions	Chronic	4.65E-03	1.00E+00	Diesel Particulate	5.0E+00	9.3E-04							
	Truck Route		2.84E-04	1.00E+00		5.0E+00	5.7E-05							
2017	On-Site Emissions		7.30E-03	1.00E+00		5.0E+00	1.5E-03							
	Truck Route		8.14E-05	1.00E+00		5.0E+00	1.6E-05							
TOTAL							2.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
					Maximum Chronic Hazard		**0.002**							

Maximum Exposed Receptor (MER) UTM coordinates: 547118.00E, 4150499.5N

* 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 C2d
PM2.5 Concentrations - Off-site K-8 Students

Contaminant	Source		MER Conc. ($\mu g/m^3$)	Concentration Annual Average ($\mu g/m^3$)
(a)	(b)		(c)	(d)
K-8 School Receptors - Unmitigated				
$PM_{2.5}$	2016	On-Site Emissions	6.76E-02	0.07
		Truck Route	2.63E-04	
	2017	On-Site Emissions	6.68E-02	0.07
		Truck Route	7.46E-05	
	Maximum Annual $PM_{2.5}$ Concentration			**0.07**

K-8 School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP				
$PM_{2.5}$	2016	On-Site Emissions	4.65E-03	0.00
		Truck Route	2.63E-04	
	2017	On-Site Emissions	7.30E-03	0.01
		Truck Route	7.46E-05	
	Maximum Annual $PM_{2.5}$ Concentration			**0.01**

Maximum Exposed Receptor (MER) UTM coordinates: 547118.00E, 4150499.5N

Table C3a
Off-site K-5 Students - Concentrations for Risk Calculations

Elementary School Receptors - Unmitigated				
Emission Source	Model Output [1] ($\mu g/m^3$)	Pollutant	Emission Rates [2] (g/s)	MER Concentrations ($\mu g/m^3$)
(a)	(b)	(c)	(d)	(f)
	Annual Average		Average Daily	Annual Average
2016 On-site	0.73	DPM	1.81E-02	**1.32E-02**
		$PM_{2.5}$	1.71E-02	**1.24E-02**
2016 Off-site	0.57	DPM	3.54E-05	**2.02E-05**
		$PM_{2.5}$	3.27E-05	**1.87E-05**
2017 On-site	0.73	DPM	1.74E-02	**1.27E-02**
		$PM_{2.5}$	1.69E-02	**1.23E-02**
2017 Off-site	0.57	DPM	1.01E-05	**5.79E-06**
		$PM_{2.5}$	9.29E-06	**5.31E-06**
Elementary School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP				
Source	Model Output [1] ($\mu g/m^3$)	Pollutant	Emission Rates [2] (g/s)	Mass GLC ($\mu g/m^3$)
(a)	(c)	(b)	(d)	(f)
	Annual Average		Average Daily	Annual Average
2016 On-site	0.73	DPM	1.18E-03	**8.57E-04**
		$PM_{2.5}$	1.18E-03	**8.57E-04**
2016 Off-site	0.57	DPM	3.54E-05	**2.02E-05**
		$PM_{2.5}$	3.27E-05	**1.87E-05**
2017 On-site	0.73	DPM	1.84E-03	**1.34E-03**
		$PM_{2.5}$	1.84E-03	**1.34E-03**
2017 Off-site	0.57	DPM	1.01E-05	**5.79E-06**
		$PM_{2.5}$	9.29E-06	**5.31E-06**

Maximum Exposed Receptor (MER) UTM coordinates: 547310.60S, 4150436.80E

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

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

Table C3b
Quantification of Carcinogenic Risks
for Off-site K-5 Students

	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) 2 < 9 years (mg/kg-day)	Carcinogenic Risks (by age bin) 2 < 9 years per million	**Total Risk** per million
		(a)	(b)	(c)	(d)	(e)	(f)	(i)	(m)	(o)
Elementary School Receptors - Unmitigated									
2016	On-Site Emissions	1.32E-02	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	4.2E-06	4.31E-02	0.04
	Truck Route	2.02E-05	1.00E+00		3.0E-04	1.1E+00	6.4E-09	6.60E-05	0.00
2017	On-Site Emissions	1.27E-02	1.00E+00		3.0E-04	1.1E+00	4.0E-06	1.76E-01	0.18
	Truck Route	5.79E-06	1.00E+00		3.0E-04	1.1E+00	1.8E-09	8.06E-05	0.00
								Total Cancer Risk	**0.22**
Elementary School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP									
2016	On-Site Emissions	8.57E-04	1.00E+00	Diesel Particulate	3.0E-04	1.1E+00	2.7E-07	2.80E-03	0.00
	Truck Route	2.02E-05	1.00E+00		3.0E-04	1.1E+00	6.4E-09	6.60E-05	0.00
2017	On-Site Emissions	1.34E-03	1.00E+00		3.0E-04	1.1E+00	4.2E-07	1.87E-02	0.02
	Truck Route	5.79E-06	1.00E+00		3.0E-04	1.1E+00	1.8E-09	8.06E-05	0.00
								Total Cancer Risk	**0.02**

Maximum Exposed Receptor (MER) UTM coordinates: 547310.60S, 4150436.80E

	OEHHA age bin	2 < 9 years
	exposure year(s)	2016-2017
Dose Exposure Factors:	exposure frequency (days/year)[1]	180
	inhalation rate (L/kg-day) [2]	640
	inhalation absorption factor	1
Risk Calculation Factors:	age sensitivity factor	3
	averaging time (years)	70

exposure durations per age bin			exposure durations (year)
	Construction Year	Risk Scalar [3]	2 < 16 years
	2016	0.23	0.23
	2017	0.98	0.98

[1] Office of Environmental Health Hazard Assessment. *Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites* . Dated February, 2004..

[2] Inhalation rate taken as the 95th percentile 8-hour breathing rates for moderate intensity activities (OEHHA, 2015).

[3] Risk scalars determined for each year of construction to adjust receptor exposures to the exposure durations for each construction year (see App A - Construction

Table C3c
Quantification of Non-Carcinogenic Risks
Chronic Hazards for Off-site K-5 Students

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)
Elementary School Receptors - Unmitigated														
2016	On-Site Emissions	Chronic	1.32E-02	1.00E+00	Diesel Particulate	5.0E+00	2.6E-03							
	Truck Route		2.02E-05	1.00E+00		5.0E+00	4.0E-06							
2017	On-Site Emissions		1.27E-02	1.00E+00		5.0E+00	2.5E-03							
	Truck Route		5.79E-06	1.00E+00		5.0E+00	1.2E-06							
TOTAL							5.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
					Maximum Chronic Hazard		**0.005**							
Elementary School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP														
2016	On-Site Emissions	Chronic	8.57E-04	1.00E+00	Diesel Particulate	5.0E+00	1.7E-04							
	Truck Route		2.02E-05	1.00E+00		5.0E+00	4.0E-06							
2017	On-Site Emissions		1.34E-03	1.00E+00		5.0E+00	2.7E-04							
	Truck Route		5.79E-06	1.00E+00		5.0E+00	1.2E-06							
TOTAL							4.5E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
					Maximum Chronic Hazard		**0.000**							

Maximum Exposed Receptor (MER) UTM coordinates: 547310.60S, 4150436.80E

* 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 C3d
PM2.5 Concentrations - Off-site K-5 Students

Contaminant		Source	MER Conc. ($\mu g/m^3$)	Concentration Annual Average ($\mu g/m^3$)
(a)		(b)	(c)	(d)
Elementary School Receptors - Unmitigated				
$PM_{2.5}$	2016	On-Site Emissions	1.24E-02	0.01
		Truck Route	1.87E-05	
	2017	On-Site Emissions	1.23E-02	0.01
		Truck Route	5.31E-06	
	Maximum Annual $PM_{2.5}$ Concentration			**0.01**

Elementary School Receptors - Mitigation: Tier 3 Engines & Level 3 DPF for eq. > 25 HP				
$PM_{2.5}$	2016	On-Site Emissions	8.57E-04	0.00
		Truck Route	1.87E-05	
	2017	On-Site Emissions	1.34E-03	0.00
		Truck Route	5.31E-06	
	Maximum Annual $PM_{2.5}$ Concentration			**0.00**

Maximum Exposed Receptor (MER) UTM coordinates: 547310.60S, 4150436.80E

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