APPENDIX C

HEALTH RISK ASSESSMENT

1. Construction Health Risk Assessment

1.1 INTRODUCTION

The Mosaic Project (the project applicant) proposes the development of a camping facility (proposed project) in unincorporated Alameda County, California. The proposed project would result in approximately 2 acres of disturbed area within a 37-acre parcel that is currently undeveloped except for mobile home, barn, garage building, and paved areas. The project site is bounded by Cull Canyon Road to the east, Twining Vine Winery to the north, Cull Canyon Regional Recreational Area to the west, and a single-family residence to the south. The following provides 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, 2017). For the most conservative results, modeling assumed construction would start at the beginning of June 2022 and be completed by December 2023 (approximately 393 workdays or 1.51 years). The nearest sensitive receptors to the project site include the single-family residence to the east. The BAAQMD has developed *Screening Tables for Air Toxics Evaluation During Construction* (2017) that evaluate construction-related health risks associated with residential, commercial, and industrial projects. According to the screening tables, the receptors are closer than the distance of 200 meters (656 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 (i.e., the nearby residences) from construction emissions at the project site, including diesel equipment exhaust (diesel particulate matter or DPM) and particulate matter less than 2.5 microns ($PM_{2.5}$).

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 Office of Environmental Health Hazard Assessment (OEHHA) guidance documents:

- BAAQMD, 2017. *California Environmental Quality Act (CEQA) Air Quality Guidelines*. May 2017.

- BAAQMD, 2016. *Planning Healthy Places*. May 2016.
- 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. Pollutant concentrations were estimated using an air dispersion model, and excess lifetime cancer risks and chronic non-cancer hazard indexes were calculated. These risks were then compared to the significance thresholds adopted for this HRA.

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 OEHHA 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 residential-based receptors, the following conservative assumptions were used:

- It was assumed that maximum-exposed off-site residential receptors (both children and adults) stood outdoors and are subject to DPM at their residence for 8 hours per day, and approximately 260 construction days per year. In reality, California residents typically will spend on average 2 hours per day outdoors at their residences (USEPA, 2011), so actual exposures and risks would be significantly lower than those calculated in this HRA.

- 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 (OEHHA, 2015).

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 2020.4 (CAPCOA, 2021). DPM emissions were based on the CalEEMod construction runs, using annual exhaust PM_{10} construction emissions presented in pounds (lbs) per day. The $PM_{2.5}$ emissions were taken from the CalEEMod output for exhaust $PM_{2.5}$ also presented in lbs per day.

The project was assumed to take place over approximately 18 months (393 workdays) from June 2022 to December 2023. 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 in that particular calendar year (i.e., 2022 and 2023). The off-site hauling emission rates were adjusted to evaluate localized emissions from the 0.36-mile haul route within 1,000 feet of the project site. The CalEEMod construction emissions output and emission rate calculations are provided in Appendix A of the HRA.

1.4 DISPERSION MODELING

Air quality modeling was performed using the AERMOD atmospheric dispersion model to assess the impact of emitted compounds on sensitive receptors near the project. 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 California Air Resources Control Board (CARB) for the nearest representative meteorological station (Oakland International Airport) with the five latest available years (2009 to 2013) of record were used to represent local weather conditions and prevailing winds (CARB, 2022).

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 (CARB, 2000).

To determine contaminant impacts during construction hours, the model's Season-Hour-Day (HRDOW) scalar option was invoked to predict flagpole-level concentrations (1.5 m for ground floor receptors and 6.1 m for 2^{nd} floor receptors) for construction emissions generated between the hours of 7:00 AM and 4:00 PM with a 1-hour lunch break.

A unit emission rate of 1 gram per second was used for all modeling runs. 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 off-site maximum exposed individual receptor (MEIR). The air dispersion modeling predicted the off-site MEIR is a single-family residence east of the site.[1]

The receptor locations are presented in Figure 1. The air dispersion model output is presented in Appendix B. The DPM and $PM_{2.5}$ concentrations at the MEIR are provided in Appendix C.

[1] The MEIR location is the receptor location associated with the maximum predicted AERMOD concentrations from off-road equipment (i.e., on-site emissions). The calculated on-site emission rates are approximately 3 to 4 orders of magnitude higher than the calculated off-site (hauling) emission rates (see Appendix A). Therefore, the maximum concentrations associated with the on-site emission sources produce the highest overall ground-level MEIR concentrations and, consequently, highest calculated health risks.

1.5 RISK CHARACTERIZATION

1.5.1 Carcinogenic Chemical Risk

A threshold of ten in a million ($10x10^{-6}$) 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 sensitive receptors, the following dose algorithm was used.

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

Where:

$\mathrm{Dose}_{\mathrm{AIR}}$	=	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. The default value of 1 was used for this assessment. 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).

For construction analysis, the exposure duration spans the length of construction (e.g. 393 workdays, approximately 1.51 years). As the length of construction is less than 2 years, only the third trimester and 0-2 age bins apply to the construction analysis for the off-site residential receptors. For residential receptors, the 95^{th} 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

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. 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 $1\text{x}10^6$ (i.e., 1 million). The calculated results are provided in Appendix C.

1.5.2 Non-Carcinogenic Hazards

An evaluation was also conducted of the potential non-cancer effects of chronic chemical exposures. 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.

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

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 Table 1.

TABLE 1. CONSTRUCTION RISK SUMMARY - UNMITIGATED

Receptor	Cancer Risk (per million)	Chronic Hazards	$PM_{2.5}$ ($\mu g/m^3$)
Maximum Exposed Individual Resident (MEIR)	8.5	0.020	0.05
BAAQMD Threshold	10	1.0	0.30
Exceeds Threshold?	**No**	**No**	**No**

Note: Cancer risk calculated using 2015 OEHHA HRA guidance.

Cancer risk for the MEIR from project-related construction emissions was calculated to be 8.5 in a million, which would not 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 MER consists of a pregnant woman in the third trimester that subsequently gives birth to an infant during the approximately 1.51-year 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 8 hours a day and exposed to all of the daily construction emissions.

For non-carcinogenic effects, the chronic hazard index identified for each toxicological endpoint totaled less than one for the MEIR. Therefore, chronic non-carcinogenic hazards are less than significant. The highest $PM_{2.5}$ annual concentration of 0.05 $\mu g/m^3$ at the MEIR location would not exceed the 0.3 $\mu g/m^3$ significance threshold.

2. References

Bay Area Air Quality Management District. 2017. *California Environmental Quality Act Air Quality Guidelines.*

———. 2016. *Planning Healthy Places.* Dated May 2016.

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

———. 2010. Screening Tables for Air Toxics Evaluation During Construction. Version 1.0. Dated May 2010.

California Air Pollution Control Officers Association (CAPCOA). 2021. California Emissions Estimator Model (CalEEMod). Version 2020.4. Prepared by: ENVIRON International Corporation and the California Air Districts.

California Air Resources Board (CARB). 2022. *Meteorological Files.* https://ww2.arb.ca.gov/resources/documents/harp-aermod-meteorological-files, accessed February 18, 2022.

———. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.*

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.

United States Environmental Protection Agency (USEPA). 2011. *Exposure Factors Handbook 2011 Edition (Final).* EPA/600/R-09/052F, 2011.

______. 2005. *Guideline on Air Quality Models* (Revised). EPA-450/2-78-027R.

Source: Nearmap, 2022; PlaceWorks, 2022

Project Site Boundary

Truck Route

Residential Receptor

Maximum Exposed Individual Receptor (MEIR)

0 530
Scale (Feet)

Figure 1

Project Site and Offsite Receptor Locations

Appendix A. Emission Rate Calculations

Average Daily Emissions and Emission Rates

Onsite Construction PM10 Exhaust Emissions[1]

Year	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/hr)	Emission Rate (g/s)
2022	0.65	8.15E-02	1.03E-02
2023	0.54	6.78E-02	8.55E-03

Onsite Construction PM2.5 Exhaust Emissions[2]

Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/hr)	Emission Rate (g/s)
0.62	7.77E-02	9.79E-03
0.52	6.54E-02	8.24E-03

Offsite Construction PM10 Exhaust Emissions[1]

Year	Average Daily Emissions (lbs/day)	Hauling Emissions w/in 1,000ft (lbs/day) [3]	Emission Rate (lbs/hr)	Emission Rate (g/s)
2022	9.15E-03	1.67E-04	2.09E-05	2.63E-06
2023	5.33E-03	9.73E-05	1.22E-05	1.53E-06

Offsite Construction PM2.5 Exhaust Emissions[2]

Average Daily Emissions (lbs/day)	Hauling Emissions w/in 1,000ft (lbs/day) [3]	Emission Rate (lbs/hr)	Emission Rate (g/s)
8.76E-03	1.60E-04	2.00E-05	2.52E-06
5.08E-03	9.27E-05	1.16E-05	1.46E-06

Note: Emissions evenly distributed over 96 modeled volume sources.

Hauling Length (miles)	20	miles
Haul Length within 1,000 ft of Site (mile) [3]	0.36	miles
Hours per work day (7:00 AM to 4:00 PM, 1-hour of breaks) [4]	8	hours

Year	Workdays	Duration [5]
2022	153	0.59
2023	240	0.92

[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 offsite average daily emissions, which is based on proportioned haul truck trip distances, are adjusted to evaluate emissions from the 0.36-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).

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

Phase Name	Start Date	End Date	CalEEMod Days	Total Days
Demolition	6/1/2022	7/18/2022	34	**47**
Demolition Debris Haul	6/1/2022	7/18/2022	34	**47**
Site Preparation	7/19/2022	7/22/2022	4	**3**
Grading	7/23/2022	8/2/2022	7	**10**
Building Construction	8/3/2022	12/1/2023	348	**485**
Paving	11/8/2023	12/1/2023	18	**23**
Architectural Coating	11/8/2023	12/1/2023	18	**23**

	Number of Construction Days Per Year		
2022	6/1/2022	12/31/2022	153
2023	1/1/2023	12/1/2023	240
		CONSTRUCTION DAYS	393

Total Construction Days Per Year		
1/1/2022	12/31/2022	260
1/1/2023	12/31/2023	260
	TOTAL DAYS	520

Appendix B. Air Dispersion Model Output

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** MODEL SETUP OPTIONS SUMMARY ***

- -

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

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:
CCVR_Sub - Meteorological data includes CCVR substitutions
TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Accepts FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: OTHER

**Model Calculates PERIOD Averages Only

**This Run Includes: 97 Source(s);   2 Source Group(s); and   15 Receptor(s)

with: 0 POINT(s), including
0 POINTCAP(s) and   0 POINTHOR(s)
and: 96 VOLUME source(s)
and: 1 AREA type source(s)
and: 0 LINE source(s)
and: 0 RLINE/RLINEXT source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with a total of   0 line(s)

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

**The AERMET Input Meteorological Data Version Date: 14134

```
**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE 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

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     1.80 ;  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 =      3.7 MB of RAM.

**Input Runstream File:          aermod.inp
**Output Print File:             aermod.out

**Detailed Error/Message File:   TMP-01.err
**File for Summary of Results:   TMP-01.sum
```

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** 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)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0000001	0	0.10417E-01	583251.7	4177740.4	139.2	4.15	2.84	3.26	NO	HRDOW
L0000002	0	0.10417E-01	583254.5	4177735.0	139.0	4.15	2.84	3.26	NO	HRDOW
L0000003	0	0.10417E-01	583257.4	4177729.6	138.8	4.15	2.84	3.26	NO	HRDOW
L0000004	0	0.10417E-01	583260.2	4177724.2	138.5	4.15	2.84	3.26	NO	HRDOW
L0000005	0	0.10417E-01	583263.1	4177718.8	138.2	4.15	2.84	3.26	NO	HRDOW
L0000006	0	0.10417E-01	583265.9	4177713.4	137.8	4.15	2.84	3.26	NO	HRDOW
L0000007	0	0.10417E-01	583268.8	4177707.9	137.7	4.15	2.84	3.26	NO	HRDOW
L0000008	0	0.10417E-01	583271.6	4177702.5	137.6	4.15	2.84	3.26	NO	HRDOW
L0000009	0	0.10417E-01	583274.5	4177697.1	137.6	4.15	2.84	3.26	NO	HRDOW
L0000010	0	0.10417E-01	583277.3	4177691.7	137.5	4.15	2.84	3.26	NO	HRDOW
L0000011	0	0.10417E-01	583280.8	4177686.7	137.4	4.15	2.84	3.26	NO	HRDOW
L0000012	0	0.10417E-01	583284.4	4177681.8	137.1	4.15	2.84	3.26	NO	HRDOW
L0000013	0	0.10417E-01	583288.0	4177676.9	136.8	4.15	2.84	3.26	NO	HRDOW
L0000014	0	0.10417E-01	583291.6	4177671.9	136.3	4.15	2.84	3.26	NO	HRDOW
L0000015	0	0.10417E-01	583295.2	4177667.0	135.6	4.15	2.84	3.26	NO	HRDOW
L0000016	0	0.10417E-01	583298.8	4177662.0	136.0	4.15	2.84	3.26	NO	HRDOW
L0000017	0	0.10417E-01	583302.4	4177657.1	136.2	4.15	2.84	3.26	NO	HRDOW
L0000018	0	0.10417E-01	583306.0	4177652.1	135.9	4.15	2.84	3.26	NO	HRDOW
L0000019	0	0.10417E-01	583309.6	4177647.2	136.1	4.15	2.84	3.26	NO	HRDOW
L0000020	0	0.10417E-01	583313.1	4177642.3	136.3	4.15	2.84	3.26	NO	HRDOW
L0000021	0	0.10417E-01	583316.7	4177637.3	136.4	4.15	2.84	3.26	NO	HRDOW
L0000022	0	0.10417E-01	583319.5	4177631.9	136.0	4.15	2.84	3.26	NO	HRDOW
L0000023	0	0.10417E-01	583321.7	4177626.2	135.8	4.15	2.84	3.26	NO	HRDOW
L0000024	0	0.10417E-01	583323.9	4177620.5	135.9	4.15	2.84	3.26	NO	HRDOW
L0000025	0	0.10417E-01	583326.1	4177614.8	136.2	4.15	2.84	3.26	NO	HRDOW
L0000026	0	0.10417E-01	583328.2	4177609.1	136.4	4.15	2.84	3.26	NO	HRDOW
L0000027	0	0.10417E-01	583330.4	4177603.4	136.2	4.15	2.84	3.26	NO	HRDOW
L0000028	0	0.10417E-01	583332.6	4177597.7	135.8	4.15	2.84	3.26	NO	HRDOW
L0000029	0	0.10417E-01	583334.8	4177592.0	135.2	4.15	2.84	3.26	NO	HRDOW
L0000030	0	0.10417E-01	583337.0	4177586.3	134.7	4.15	2.84	3.26	NO	HRDOW
L0000031	0	0.10417E-01	583339.2	4177580.6	134.7	4.15	2.84	3.26	NO	HRDOW
L0000032	0	0.10417E-01	583341.4	4177574.9	134.6	4.15	2.84	3.26	NO	HRDOW
L0000033	0	0.10417E-01	583343.6	4177569.2	134.6	4.15	2.84	3.26	NO	HRDOW
L0000034	0	0.10417E-01	583345.8	4177563.5	134.6	4.15	2.84	3.26	NO	HRDOW
L0000035	0	0.10417E-01	583348.0	4177557.8	134.3	4.15	2.84	3.26	NO	HRDOW
L0000036	0	0.10417E-01	583349.5	4177551.9	133.6	4.15	2.84	3.26	NO	HRDOW
L0000037	0	0.10417E-01	583350.6	4177545.9	132.8	4.15	2.84	3.26	NO	HRDOW
L0000038	0	0.10417E-01	583351.7	4177539.9	132.1	4.15	2.84	3.26	NO	HRDOW
L0000039	0	0.10417E-01	583352.8	4177533.8	131.5	4.15	2.84	3.26	NO	HRDOW
L0000040	0	0.10417E-01	583353.9	4177527.8	131.0	4.15	2.84	3.26	NO	HRDOW

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** 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)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0000041	0	0.10417E-01	583354.9	4177521.8	131.8	4.15	2.84	3.26	NO	HRDOW
L0000042	0	0.10417E-01	583356.0	4177515.8	132.5	4.15	2.84	3.26	NO	HRDOW
L0000043	0	0.10417E-01	583357.1	4177509.8	133.2	4.15	2.84	3.26	NO	HRDOW
L0000044	0	0.10417E-01	583358.2	4177503.8	133.7	4.15	2.84	3.26	NO	HRDOW
L0000045	0	0.10417E-01	583359.2	4177497.8	134.2	4.15	2.84	3.26	NO	HRDOW
L0000046	0	0.10417E-01	583360.3	4177491.7	134.1	4.15	2.84	3.26	NO	HRDOW
L0000047	0	0.10417E-01	583361.4	4177485.7	134.0	4.15	2.84	3.26	NO	HRDOW
L0000048	0	0.10417E-01	583362.5	4177479.7	133.9	4.15	2.84	3.26	NO	HRDOW
L0000049	0	0.10417E-01	583363.6	4177473.7	133.8	4.15	2.84	3.26	NO	HRDOW
L0000050	0	0.10417E-01	583364.6	4177467.7	133.7	4.15	2.84	3.26	NO	HRDOW
L0000051	0	0.10417E-01	583365.7	4177461.7	133.6	4.15	2.84	3.26	NO	HRDOW
L0000052	0	0.10417E-01	583366.8	4177455.7	133.6	4.15	2.84	3.26	NO	HRDOW
L0000053	0	0.10417E-01	583367.9	4177449.6	133.6	4.15	2.84	3.26	NO	HRDOW
L0000054	0	0.10417E-01	583369.0	4177443.6	133.6	4.15	2.84	3.26	NO	HRDOW
L0000055	0	0.10417E-01	583370.3	4177437.7	133.6	4.15	2.84	3.26	NO	HRDOW
L0000056	0	0.10417E-01	583371.6	4177431.7	133.6	4.15	2.84	3.26	NO	HRDOW
L0000057	0	0.10417E-01	583372.9	4177425.7	133.8	4.15	2.84	3.26	NO	HRDOW
L0000058	0	0.10417E-01	583374.2	4177419.8	134.0	4.15	2.84	3.26	NO	HRDOW
L0000059	0	0.10417E-01	583375.5	4177413.8	134.1	4.15	2.84	3.26	NO	HRDOW
L0000060	0	0.10417E-01	583376.8	4177407.8	134.1	4.15	2.84	3.26	NO	HRDOW
L0000061	0	0.10417E-01	583378.1	4177401.8	134.1	4.15	2.84	3.26	NO	HRDOW
L0000062	0	0.10417E-01	583379.4	4177395.9	134.0	4.15	2.84	3.26	NO	HRDOW
L0000063	0	0.10417E-01	583380.7	4177389.9	133.8	4.15	2.84	3.26	NO	HRDOW
L0000064	0	0.10417E-01	583382.0	4177383.9	133.6	4.15	2.84	3.26	NO	HRDOW
L0000065	0	0.10417E-01	583383.3	4177378.0	133.2	4.15	2.84	3.26	NO	HRDOW
L0000066	0	0.10417E-01	583384.6	4177372.0	133.0	4.15	2.84	3.26	NO	HRDOW
L0000067	0	0.10417E-01	583385.9	4177366.0	132.9	4.15	2.84	3.26	NO	HRDOW
L0000068	0	0.10417E-01	583387.1	4177360.0	132.8	4.15	2.84	3.26	NO	HRDOW
L0000069	0	0.10417E-01	583387.9	4177354.0	132.5	4.15	2.84	3.26	NO	HRDOW
L0000070	0	0.10417E-01	583388.6	4177347.9	132.2	4.15	2.84	3.26	NO	HRDOW
L0000071	0	0.10417E-01	583389.2	4177341.8	131.9	4.15	2.84	3.26	NO	HRDOW
L0000072	0	0.10417E-01	583389.9	4177335.8	131.6	4.15	2.84	3.26	NO	HRDOW
L0000073	0	0.10417E-01	583390.6	4177329.7	131.3	4.15	2.84	3.26	NO	HRDOW
L0000074	0	0.10417E-01	583391.2	4177323.6	131.1	4.15	2.84	3.26	NO	HRDOW
L0000075	0	0.10417E-01	583391.9	4177317.5	130.8	4.15	2.84	3.26	NO	HRDOW
L0000076	0	0.10417E-01	583392.5	4177311.5	130.7	4.15	2.84	3.26	NO	HRDOW
L0000077	0	0.10417E-01	583393.2	4177305.4	130.9	4.15	2.84	3.26	NO	HRDOW
L0000078	0	0.10417E-01	583393.9	4177299.3	131.1	4.15	2.84	3.26	NO	HRDOW
L0000079	0	0.10417E-01	583394.5	4177293.3	131.2	4.15	2.84	3.26	NO	HRDOW
L0000080	0	0.10417E-01	583395.2	4177287.2	131.4	4.15	2.84	3.26	NO	HRDOW

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** 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)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0000081	0	0.10417E-01	583395.8	4177281.1	131.5	4.15	2.84	3.26	NO	HRDOW
L0000082	0	0.10417E-01	583396.5	4177275.0	131.5	4.15	2.84	3.26	NO	HRDOW
L0000083	0	0.10417E-01	583397.3	4177269.0	131.5	4.15	2.84	3.26	NO	HRDOW
L0000084	0	0.10417E-01	583398.3	4177263.0	131.7	4.15	2.84	3.26	NO	HRDOW
L0000085	0	0.10417E-01	583399.4	4177256.9	131.8	4.15	2.84	3.26	NO	HRDOW
L0000086	0	0.10417E-01	583400.4	4177250.9	131.9	4.15	2.84	3.26	NO	HRDOW
L0000087	0	0.10417E-01	583401.5	4177244.9	131.6	4.15	2.84	3.26	NO	HRDOW
L0000088	0	0.10417E-01	583402.5	4177238.9	131.3	4.15	2.84	3.26	NO	HRDOW
L0000089	0	0.10417E-01	583403.6	4177232.9	131.0	4.15	2.84	3.26	NO	HRDOW
L0000090	0	0.10417E-01	583404.7	4177226.8	130.7	4.15	2.84	3.26	NO	HRDOW
L0000091	0	0.10417E-01	583405.7	4177220.8	130.4	4.15	2.84	3.26	NO	HRDOW
L0000092	0	0.10417E-01	583406.8	4177214.8	130.3	4.15	2.84	3.26	NO	HRDOW
L0000093	0	0.10417E-01	583408.1	4177208.8	130.3	4.15	2.84	3.26	NO	HRDOW
L0000094	0	0.10417E-01	583409.5	4177202.9	130.2	4.15	2.84	3.26	NO	HRDOW
L0000095	0	0.10417E-01	583411.0	4177197.0	130.1	4.15	2.84	3.26	NO	HRDOW
L0000096	0	0.10417E-01	583412.4	4177191.0	129.9	4.15	2.84	3.26	NO	HRDOW

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	LOCATION OF AREA Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
1	0	0.10626E-03	583245.9	4177742.9	138.6	4.15	34	1.93	NO	HRDOW

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs							
ONSITE	1 ,							
OFFSITE	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 ,	L0000080 ,
	L0000081 ,	L0000082 ,	L0000083 ,	L0000084 ,	L0000085 ,	L0000086 ,	L0000087 ,	L0000088 ,
	L0000089 ,	L0000090 ,	L0000091 ,	L0000092 ,	L0000093 ,	L0000094 ,	L0000095 ,	L0000096 ,

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000001 TO L0000096 ; SOURCE TYPE = VOLUME :

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

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = 1 ; SOURCE TYPE = AREAPOLY :

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

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

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

(583245.8,	4177327.3,	144.5,	356.0,	1.5);	(583379.6,	4177521.9,	137.0,	356.0,	1.5);
(583445.0,	4177231.5,	138.3,	352.5,	1.5);	(583297.6,	4177787.6,	153.1,	356.0,	1.5);
(583298.2,	4177880.6,	147.5,	356.0,	1.5);	(583341.8,	4177938.0,	147.8,	356.0,	1.5);
(583199.8,	4177949.9,	139.5,	356.0,	1.5);	(583245.8,	4177327.3,	144.5,	356.0,	6.1);
(583445.0,	4177231.5,	138.3,	352.5,	6.1);	(583297.6,	4177787.6,	153.1,	356.0,	6.1);
(583298.2,	4177880.6,	147.5,	356.0,	6.1);	(583341.8,	4177938.0,	147.8,	356.0,	6.1);
(583199.8,	4177949.9,	139.5,	356.0,	6.1);	(583450.2,	4177166.8,	134.7,	352.5,	1.5);
(583450.2,	4177166.8,	134.7,	352.5,	6.1);					

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** 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
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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,

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

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

Surface file: met data - 1.8m\724930.SFC Met Version: 14134
Profile file: met data - 1.8m\724930.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23230 Upper air station no.: 23230
Name: OAKLAND/WSO_AP Name: OAKLAND/WSO_AP
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-17.2	0.303	-9.000	-9.000	-999.	401.	147.2	0.63	0.86	1.00	2.36	81.	10.0	282.5	2.0
09	01	01	1	02	-21.8	0.383	-9.000	-9.000	-999.	569.	234.6	0.63	0.86	1.00	2.86	68.	10.0	282.0	2.0
09	01	01	1	03	-26.3	0.460	-9.000	-9.000	-999.	749.	337.1	0.63	0.86	1.00	3.36	84.	10.0	280.9	2.0
09	01	01	1	04	-15.4	0.270	-9.000	-9.000	-999.	368.	116.1	0.47	0.86	1.00	2.36	53.	10.0	280.9	2.0
09	01	01	1	05	-26.3	0.460	-9.000	-9.000	-999.	749.	336.3	0.63	0.86	1.00	3.36	73.	10.0	280.4	2.0
09	01	01	1	06	-21.9	0.383	-9.000	-9.000	-999.	573.	232.9	0.63	0.86	1.00	2.86	82.	10.0	280.4	2.0
09	01	01	1	07	-22.0	0.383	-9.000	-9.000	-999.	569.	232.5	0.63	0.86	1.00	2.86	95.	10.0	279.9	2.0
09	01	01	1	08	-11.2	0.196	-9.000	-9.000	-999.	238.	60.6	0.63	0.86	0.76	1.76	73.	10.0	279.9	2.0
09	01	01	1	09	-2.2	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	0.39	0.00	0.	10.0	280.4	2.0
09	01	01	1	10	6.8	0.266	0.264	0.016	98.	329.	-250.8	0.63	0.86	0.27	1.76	91.	10.0	280.9	2.0
09	01	01	1	11	15.5	-9.000	-9.000	-9.000	177.	-999.	-99999.0	0.45	0.86	0.22	0.00	0.	10.0	282.0	2.0
09	01	01	1	12	96.1	0.393	1.019	0.014	401.	591.	-57.4	0.22	0.86	0.21	3.36	266.	10.0	281.4	2.0
09	01	01	1	13	102.5	0.395	1.092	0.014	462.	595.	-54.4	0.22	0.86	0.20	3.36	283.	10.0	282.0	2.0
09	01	01	1	14	89.9	0.297	1.066	0.015	489.	394.	-26.5	0.22	0.86	0.21	2.36	249.	10.0	282.0	2.0
09	01	01	1	15	62.1	0.383	0.954	0.014	507.	569.	-82.1	0.22	0.86	0.24	3.36	242.	10.0	282.5	2.0
09	01	01	1	16	23.1	0.665	0.690	0.006	513.	1300.	-1150.4	0.52	0.86	0.33	4.86	304.	10.0	282.5	2.0
09	01	01	1	17	-37.0	0.486	-9.000	-9.000	-999.	846.	280.6	0.22	0.86	0.56	4.86	291.	10.0	281.4	2.0
09	01	01	1	18	-52.2	0.480	-9.000	-9.000	-999.	799.	191.9	0.52	0.86	1.00	3.86	307.	10.0	280.9	2.0
09	01	01	1	19	-25.6	0.224	-9.000	-9.000	-999.	327.	39.8	0.52	0.86	1.00	2.36	334.	10.0	280.4	2.0
09	01	01	1	20	-11.1	0.119	-9.000	-9.000	-999.	115.	13.8	0.52	0.86	1.00	1.76	317.	10.0	280.4	2.0
09	01	01	1	21	-10.3	0.119	-9.000	-9.000	-999.	98.	14.7	0.52	0.86	1.00	1.76	320.	10.0	280.4	2.0
09	01	01	1	22	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	280.9	2.0
09	01	01	1	23	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	281.4	2.0
09	01	01	1	24	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	281.4	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	81.	2.36	282.6	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** THE PERIOD (43872 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ONSITE ***
INCLUDING SOURCE(S): 1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

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

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC	
583245.75	4177327.30	0.15760	583379.64	4177521.91	5.22432	Residential MER (Onsite)
583444.96	4177231.53	0.21283	583297.64	4177787.64	2.05171	
583298.21	4177880.59	0.65650	583341.79	4177938.01	0.38734	
583199.79	4177949.93	0.37267	583245.75	4177327.30	0.14193	
583444.96	4177231.53	0.19684	583297.64	4177787.64	1.74498	
583298.21	4177880.59	0.61167	583341.79	4177938.01	0.36832	
583199.79	4177949.93	0.34623	583450.23	4177166.76	0.13763	
583450.23	4177166.76	0.13220				

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** THE PERIOD (43872 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: OFFSITE ***

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 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

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

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC	
583245.75	4177327.30	0.54632	583379.64	4177521.91	11.56969	Residential MER (Offsite)
583444.96	4177231.53	6.35338	583297.64	4177787.64	1.06366	
583298.21	4177880.59	0.38862	583341.79	4177938.01	0.25276	
583199.79	4177949.93	0.23276	583245.75	4177327.30	0.45928	
583444.96	4177231.53	4.35750	583297.64	4177787.64	0.88147	
583298.21	4177880.59	0.36066	583341.79	4177938.01	0.23867	
583199.79	4177949.93	0.22026	583450.23	4177166.76	2.24715	
583450.23	4177166.76	1.73709				

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL RURAL

*** THE SUMMARY OF MAXIMUM PERIOD (43872 HRS) RESULTS ***

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

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ONSITE	1ST HIGHEST VALUE IS	5.22432	AT	(583379.64, 4177521.91, 136.98, 356.01, 1.50)	DC	
	2ND HIGHEST VALUE IS	2.05171	AT	(583297.64, 4177787.64, 153.09, 356.01, 1.50)	DC	
	3RD HIGHEST VALUE IS	1.74498	AT	(583297.64, 4177787.64, 153.09, 356.01, 6.10)	DC	
	4TH HIGHEST VALUE IS	0.65650	AT	(583298.21, 4177880.59, 147.53, 356.01, 1.50)	DC	
	5TH HIGHEST VALUE IS	0.61167	AT	(583298.21, 4177880.59, 147.53, 356.01, 6.10)	DC	
	6TH HIGHEST VALUE IS	0.38734	AT	(583341.79, 4177938.01, 147.80, 356.01, 1.50)	DC	
	7TH HIGHEST VALUE IS	0.37267	AT	(583199.79, 4177949.93, 139.46, 356.01, 1.50)	DC	
	8TH HIGHEST VALUE IS	0.36832	AT	(583341.79, 4177938.01, 147.80, 356.01, 6.10)	DC	
	9TH HIGHEST VALUE IS	0.34623	AT	(583199.79, 4177949.93, 139.46, 356.01, 6.10)	DC	
	10TH HIGHEST VALUE IS	0.21283	AT	(583444.96, 4177231.53, 138.28, 352.48, 1.50)	DC	
OFFSITE	1ST HIGHEST VALUE IS	11.56969	AT	(583379.64, 4177521.91, 136.98, 356.01, 1.50)	DC	
	2ND HIGHEST VALUE IS	6.35338	AT	(583444.96, 4177231.53, 138.28, 352.48, 1.50)	DC	
	3RD HIGHEST VALUE IS	4.35750	AT	(583444.96, 4177231.53, 138.28, 352.48, 6.10)	DC	
	4TH HIGHEST VALUE IS	2.24715	AT	(583450.23, 4177166.76, 134.71, 352.48, 1.50)	DC	
	5TH HIGHEST VALUE IS	1.73709	AT	(583450.23, 4177166.76, 134.71, 352.48, 6.10)	DC	
	6TH HIGHEST VALUE IS	1.06366	AT	(583297.64, 4177787.64, 153.09, 356.01, 1.50)	DC	
	7TH HIGHEST VALUE IS	0.88147	AT	(583297.64, 4177787.64, 153.09, 356.01, 6.10)	DC	
	8TH HIGHEST VALUE IS	0.54632	AT	(583245.75, 4177327.30, 144.51, 356.01, 1.50)	DC	
	9TH HIGHEST VALUE IS	0.45928	AT	(583245.75, 4177327.30, 144.51, 356.01, 6.10)	DC	
	10TH HIGHEST VALUE IS	0.38862	AT	(583298.21, 4177880.59, 147.53, 356.01, 1.50)	DC	

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

```
*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  RURAL

*** Message Summary : AERMOD Model Execution ***

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

A Total of            0 Fatal Error Message(s)
A Total of            0 Warning Message(s)
A Total of         7953 Informational Message(s)

A Total of        43872 Hours Were Processed

A Total of         7152 Calm Hours Identified

A Total of          801 Missing Hours Identified (  1.83 Percent)


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


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


   ************************************
   *** AERMOD Finishes Successfully ***
   ************************************
```

Appendix C. Construction Risk Calculations

Table C2
Residential MER Health Risk Calculations

Contaminant (a)	Source (b)		Model Output [1] ($\mu g/m^3$) (c)	Emission Rates [2] (g/s) (d)	MEIR Conc. ($\mu g/m^3$) (e)	Total MEIR Conc. Annual Average ($\mu g/m^3$) (f)
Residential Receptors - Unmitigated						
DPM	2022	On-Site Emissions	5.22	1.03E-02	5.36E-02	5.36E-02
		Truck Route	11.57	2.63E-06	3.04E-05	
	2023	On-Site Emissions	5.22	8.55E-03	4.47E-02	4.47E-02
		Truck Route	11.57	1.53E-06	1.77E-05	
			Total DPM concentrations used for Cancer Risk and Chronic Hazard calculations			
$PM_{2.5}$	2022	On-Site Emissions	5.22	9.79E-03	5.11E-02	5.12E-02
		Truck Route	11.57	2.52E-06	2.91E-05	
	2023	On-Site Emissions	5.22	8.24E-03	4.31E-02	4.31E-02
		Truck Route	11.57	1.46E-06	1.69E-05	
			Maximum Annual $PM_{2.5}$ Concentration			**0.05**

Maximum Exposed Individual Resident (MEIR) UTM coordinates: 583379.64 E, 4177521.91 N

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

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

NOTE: The MEIR location is the receptor location associated with the maximum predicted AERMOD concentrations from off-road equipment (i.e., on-site emissions). The calculated on-site emission rates are approximately 3 to 4 orders of magnitude higher than the calculated off-site (hauling) emission rates (see Column d). Therefore, the maximum concentrations associated with the on-site emission sources produce the highest overall ground-level MEIR concentrations and, consequently, highest calculated health risks.

Table C2
Residential MER Health Risk Calculations

Source		MEIR Conc. (µg/m³)	Weight Fraction	Contaminant	URF (µg/m³)⁻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 Cancer Risk** per million	**Chronic Hazards [3]** REL (µg/m³)	**Chronic Hazards [3]** RESP
(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(j)	(k)	(m)	(n)	(o)
Residential Receptors - Unmitigated													
2022	On & Off-Site	5.36E-02	1.00E+00	DPM	3.0E-04	1.1E+00	1.86E-05	5.61E-05	5.92E-01	2.42E+00	3.0	5.0E+00	1.07E-02
2023		4.47E-02						4.67E-05		5.49E+00	5.5		8.93E-03
											8.5		**0.020**

Maximum Exposed Individual Resident (MEIR) UTM coordinates: 583379.64 E, 4177521.91 N

		3rd Trimester	0 < 2 years
	OEHHA age bin exposure year(s)	2022	2022-2023
Dose Exposure Factors:	exposure frequency (days/year)	350	350
	inhalation rate (L/kg-day) [1]	361	1090
	inhalation absorption factor	1	1
	conversion factor (mg/µg; m³/L)	1.0E-06	1.0E-06
Risk Calculation Factors:	age sensitivity factor	10	10
	averaging time (years)	70	70
	per million	1.0E+06	1.0E+06
	fraction of time at home	0.85	0.85

exposure durations per age bin		exposure durations (year)	
Construction Year	Duration [2]	3rd Trimester	0 < 2 years
2022	0.59	0.25	0.34
2023	0.92		0.92
Total	1.51	0.25	1.26

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

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

[3] Chronic Hazards for DPM using the chronic reference exposure level (REL) for the Respiratory Toxicological Endpoint.