TRACY HILLS SPECIFIC PLAN

DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

VOLUME II

DECEMBER 2014

APPENDIX B

AIR QUALITY AND GREENHOUSE GAS DATA, DATED NOVEMBER 2013, MARCH 2014, AND OCTOBER 2014

TRACY HILLS PHASE 1

HEALTH RISK ASSESSMENT

CITY OF TRACY

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November 7, 2013

JN:08558-02 HRA Report

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LIST OF ABBREVIATED TERMS

(1)	Reference
µg/m3	Microgram per Cubic Meter
AADT	Annual Average Daily Trips
ARB	California Air Resources Board
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DPM	Diesel Particulate Matter
EPA	Environmental Protection Agency
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
NAAQS	National Ambient Air Quality Standards
NOx	Oxides of Nitrogen
NO2	Nitrogen Dioxide
PM10	Particulate Matter 10 microns in diameter or less
PM2.5	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
Project	Tracy Hills Phase 1
ROG	Reactive Organic Gases
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
TAC	Toxic Air Contaminant
TOG	Total Organic Gases
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds

1 INTRODUCTION

In 2005, the California Air Resources Board (ARB) promulgated an advisory recommendation to avoid siting sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day or rural roads with 50,000 vehicles per day. According to the ARB, the increased cancer risk is 300 to 1,700 per million within this domain. The strongest association of traffic related emissions with adverse health outcomes was seen within 300 feet of roadways with high truck densities. Notwithstanding, the ARB notes that a site specific analysis would be required to determine the actual risk near a particular land use and should consider factors such as prevailing wind direction, local topography and climate.

Additionally, the California Code of Regulations, Title 14 (the CEQA Guidelines), Section 15126.2(a) recommends that significant environmental effects of a project be assessed when a project brings development and people into an affected area. However, CEQA case law has held that CEQA requires the lead agency to analyze the impacts of the project on the environment, not the impacts of the environment on the project. Although not required by CEQA, in an abundance of caution, the lead agency, the city of Tracy, has requested the preparation of this assessment. Therefore, for the proposed project, adjoining freeway emissions are a potential concern and relevant thresholds and standards exist to determine the impact of vehicular emissions on an exposed population. As such, a health risk assessment was prepared to assess the impact of these emissions on individuals residing at the proposed project site.

In consideration of the above referenced, ARB advisory recommendation, the assessment and dispersion modeling methodologies used in the preparation of this report were composed of all relevant and appropriate procedures presented by the U.S. Environmental Protection Agency, California Environmental Protection Agency and San Joaquin Valley Air Pollution Control District (SJVAPCD). The methodologies and assumptions offered under this regulatory guidance were used to ensure that the assessment effectively quantified residential exposures associated with the generation of contaminant emissions from adjacent mobile source activity.

This report summarizes the protocol used to evaluate contaminant exposures and presents the results of the health risk assessment.

1.1 SITE LOCATION

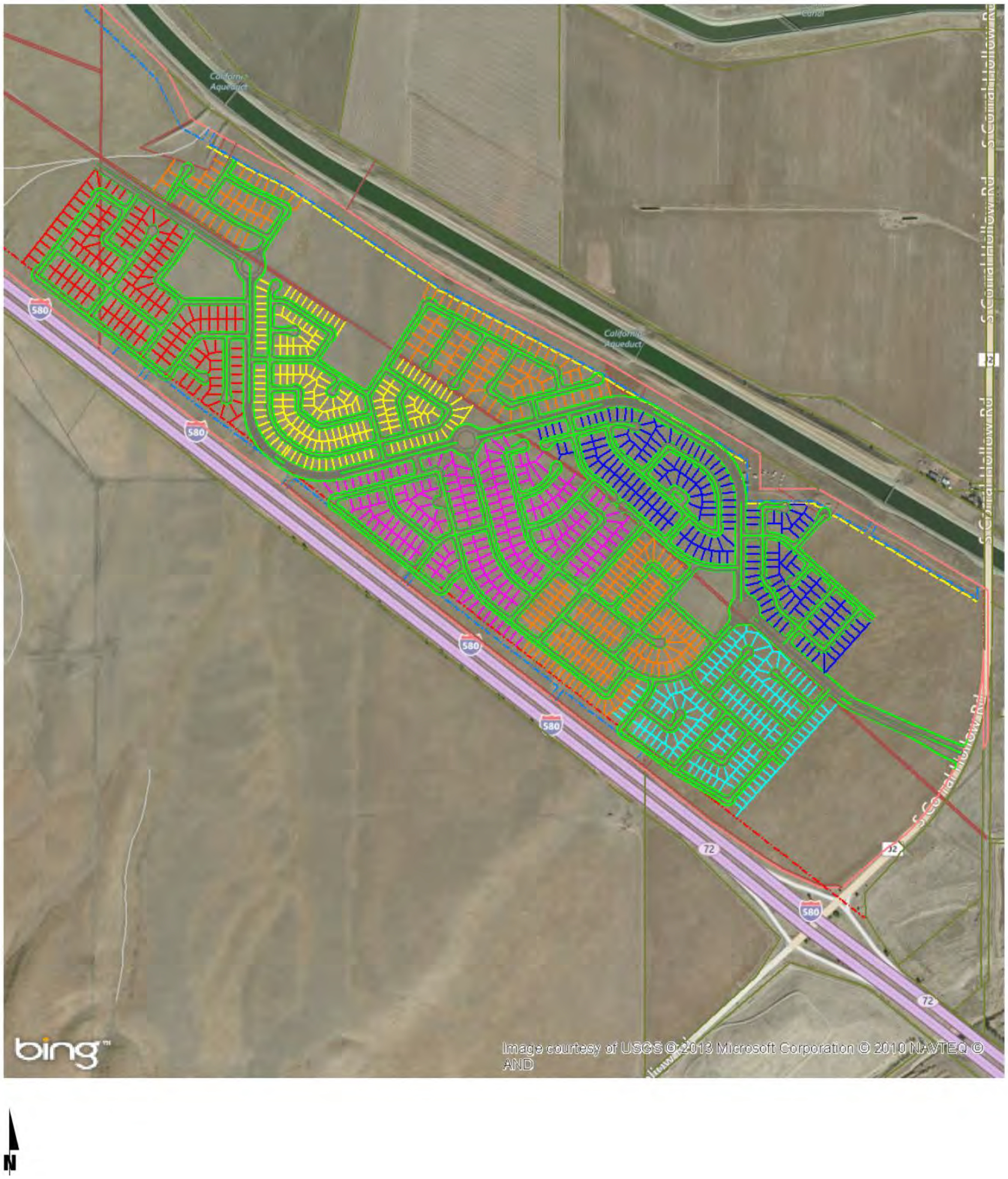
The proposed Tracy Hills Phase 1 development is located within the City of Tracy, east of Interstate 580 (I-580) and north of South Corral Hollow Road as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The Project includes construction of approximately 1,200 residential lots and 50 acres of business park use, Exhibit 1-B illustrates a preliminary conceptual site plan.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: PRELIMINARY SITE PLAN



1.3 PROJECT DESCRIPTION

The Project applicant has agreed to installing air filtration systems with efficiencies equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 13 (or equivalent system) as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2.

The average particle size efficiency (PSE) removal based on ASHRAE Standard 52.2 for MERV 13 is approximately 75% for 0.3 to 1.0 μg/m3(DPM) and 90% for 1.0 to 10 μg/m3(PM10 and PM2.5)1.

Additionally, the Project will include the planting of Afgan and Alppo Pine trees (coniferous evergreens) to serve as a buffer between the Freeway and the Project site and further reduce potential DPM impacts. UC Davis and Caltrans prepared a white paper: Practical Mitigation Measures for Particulate Matter: Near-Road Vegetation Barriers. The white paper identifies coniferous evergreens as the most ideal plant for removal of diesel PM. The white paper also notes the potential benefits and impacts of vegetation and sound wall as barriers for DPM but ultimately notes that further research is required to effectively quantify any potential benefits. As such, the analysis herein takes no credit from the implementation of vegetation and/or sound walls.

1.4 SUMMARY OF FINDINGS

Without Project Design Feature

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor totaled 1.72E-05 (17.2 in one million) for the 70 year, 7.36E-06 (7.36 in one million) for the 30 year and 2.21E-06 (2.21 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of ten in one million, carcinogenic risks will exceed the applicable threshold for the 70 year exposure scenario only. Therefore, carcinogenic exposures have the potential to be significant without implementation of the air filtration project design feature (MERV 13 or equivalent air filtration system).

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for the 70, 30 and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed the threshold of 1.0. Therefore, noncarcinogenic hazards are calculated to be within acceptable limits and a less than significant impact would occur.

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM_{10} concentrations of 4.87μg/m^3 and 1.26 μg/m^3 for the 24-hour and annual averaging times. These values will not exceed the SJVAPCD significance thresholds of

[1] The use of MERV filtration systems to reduce DPM and particulates has been successfully implemented by several lead agencies, including, but not limited to: City of Los Angeles, City of Claremont, City of Irvine, City of Glendale, City of Berkley, City of Oakland, and the Los Angeles Unified School District (LAUSD).

10.4 μg/m^3 and 2.8 μg/m^3, respectively. For $PM_{2.5}$, concentrations of 1.97 μg/m^3 and 0.57 μg/m^3 for the 24-hour and annual averaging times were predicted. These values will not exceed the SJVAPCD significance thresholds of 2.5 μg/m^3 and 0.63 μg/m^3, respectively

The maximum modeled 1-hour average concentration for CO of 0.03 parts per million (ppm) (29.9571 μg/m^3) when added to an existing background concentration of 3.2 ppm totals 3.23 ppm and will not cause an exceedance of the CAAQS of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.02 ppm, (19.2567 μg/m^3) when added to an existing background level of 2.1 ppm totals 2.12 ppm and does not cause an exceedance of the CAAQS of 9 ppm.

For NO_2, a maximum one hour concentration of 0.014 ppm (25.8147 μg/m^3) was predicted. This concentration, when added to a background concentration of 0.04 ppm totals 0.054 ppm and will not cause an exceedance of the CAAQS of 0.18 ppm.

As noted, short duration (i.e., 1 and 8-hour) exposures associated with both toxic and criteria pollutants are within acceptable limits. As such, less than significant impacts are anticipated to residents who access and utilize outdoor amenities.

With Project Design Feature

With implementation of the applicable project design feature (MERV13 or equivalent air filtration system) the summation of carcinogenic risk for the maximum exposed residential receptor totaled 6.97E-06 (6.97 in one million) for the 70 year, 2.99E-06 (2.99 in one million) for the 30 year and 8.96E-07 (0.896 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of ten in one million, carcinogenic risks will not exceed the applicable thresholds for the 70, 30, or 9 year exposure scenario. Therefore, carcinogenic exposures are calculated to be within acceptable limits and are less than significant.

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for the 70, 30 and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed the threshold of 1.0. Therefore, noncarcinogenic hazards are calculated to be within acceptable limits and a less than significant impact would occur.

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM_{10} concentrations of 0.5 μg/m^3 and 0.13 μg/m^3 for the 24-hour and annual averaging times. These values will not exceed the SJVAPCD significance thresholds of 10.4 μg/m^3 and 2.8 μg/m^3, respectively. For $PM_{2.5}$, concentrations of 0.20 μg/m^3 and 0.06 μg/m^3 for the 24-hour and annual averaging times were predicted. These values will not exceed the SJVAPCD significance thresholds of 2.5 μg/m^3 and 0.63 μg/m^3, respectively

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As noted, short duration (i.e., 1 and 8-hour) exposures associated with both toxic and criteria pollutants are within acceptable limits. As such, less than significant impacts are anticipated to residents who access and utilize outdoor amenities.

2 SOURCE IDENTIFICATION

The California Department of Transportation (Caltrans), Traffic and Vehicle Data Systems Unit collects and maintains traffic volume counts for vehicles traversing the California state highway system. Discrete data sets are available for main highway segments and adjoining freeway ramp volumes. For analysis purposes, the *Interstate 580 Transportation Concept Report* (Caltrans District 10) was used to determine future ramp volumes along the freeway mainline. Table 2-1 presents the annual average daily traffic volumes (AADT) for the roadway segments considered in the assessment.

TABLE 2-1: ANNUAL AVERAGE DAILY TRAFFIC VOLUMES

Roadway Segment	Postmile	Annual Average Daily Traffic (AADT)
Interstate 580	8.15-15.34	70,000
WB On / Corral Hollow	8.256	1,750
WB Off / Corral Hollow	8.004	2,150
EB On / Corral Hollow	8.015	2,050
EB Off / Corral Hollow	8.281	1,490

Source: California Department of Transportation, 2013. Traffic and Vehicle Data Systems Unit. Website: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/ and Interstate 580 Transportation Concept Report (Caltrans District 10), 2013.

3 SOURCE CHARACTERIZATION

In urban communities, vehicle emissions substantially contribute to localized concentrations of air contaminants. Typically, emissions generated from these sources are characterized by vehicle mix, the rate pollutants are generated during the course of travel and the number of vehicles traversing the roadway network.

Currently, emission factors are generated from a series of computer based programs to produce a composite emission rate for vehicles traveling at various speeds within a defined geographical area or along a discrete roadway segment. To account for the emission standards imposed on the California fleet, the ARB has developed the EMFAC2011 emission factor model. EMFAC2011 was utilized to identify pollutant emission rates for total organic gases (TOG), diesel particulates, particulates (PM_{10} and $PM_{2.5}$), carbon monoxide (CO) and nitrogen oxide (NO_x) compounds. To produce a representative vehicle fleet distribution, the assessment utilized ARB's San Joaquin County population estimates for the 2025 calendar year. This approach provides an estimate of vehicle mix associated with operational profiles at the link or intersection level. Table 3-1 lists the identified fleet mix considered in the assessment.

Based upon the freeway traffic volumes and population profiles noted above, discrete traffic counts were identified for each modeled roadway segment (e.g., I-580 WB, I-580 EB, and on/off ramps). Diesel vehicles account for 5.26 percent of the on-road mobile fleet. For chronic (long term) and acute (e.g., 1-hour) exposures, AADT values were averaged to produce representative hourly traffic volumes. Table 3-2 presents the hourly traffic volumes considered in the assessment.

TABLE 3-1: VEHICLE FLEET MIX PROFILE

Vehicle Class	Fuel Type	San Joaquin County Population	Percent
LDA	Diesel	837.12	0.15
LDA	Gas	260,852.53	47.00
LDT1	Diesel	49.85	0.01
LDT1	Gas	38,406.28	6.92
LDT2	Diesel	45.83	0.01
LDT2	Gas	88,492.32	15.95
LHD1	Diesel	10,333.71	1.86
LHD1	Gas	14,993.68	2.70
LHD2	Diesel	2,341.41	0.42
LHD2	Gas	1,043.35	0.19
MCY	Gas	15,453.01	2.78
MDV	Diesel	80.77	0.01
MDV	Gas	101,688.15	18.32
MH	Diesel	711.41	0.13
MH	Gas	3,474.94	0.63
T6	Diesel	6,329.70	1.14
T6	Gas	956.16	0.17
T7	Diesel	7,849.93	1.41
T7	Gas	63.03	0.01
OBUS	Diesel	142.52	0.03
OBUS	Gas	247.55	0.04
SBUS	Diesel	274.53	0.05
SBUS	Gas	62.14	0.01
UBUS	Diesel	195.90	0.04
UBUS	Gas	39.42	0.01

Note: Vehicle category descriptions can be found on the California Air Resources Board website at http://www.arb.ca.gov/msei/modeling.htm.

TABLE 3-2: HOURLY AVERAGE DAILY TRAFFIC VOLUMES

Roadway Segment	All	Gas	Diesel
Interstate 580	2,917	2,763	153
WB On / Corral Hollow	73	69	4
WB Off / Corral Hollow	90	85	5
EB On / Corral Hollow	85	81	4
EB Off / Corral Hollow	62	59	3

Route speeds were assumed for vehicles traversing the main highway link (Interstate 580) based on the *Interstate 580 Transportation Concept Report* (Caltrans District 10, 2003) at 70 miles per hour. Emissions associated with acceleration and deceleration (i.e., on/off ramps) were based upon vehicle speeds of 45 and 5 miles per hour, respectively. These values were subsequently adjusted utilizing the modal algorithms presented in the California Line Source Dispersion Model (Caline4).

For particulates (PM10 and PM2.5), emissions were quantified through the re-entrainment of paved roadway dust. The predictive emission equation developed by the U.S. Environmental Protection Agency (AP-42, Section 13.2.1) was utilized to generate particulate source strength. To account for the mass rate of emissions entrained from the roadway surface, the contribution from exhaust, break and tire wear were added to the AP-42 emission factor equation.

A list of compounds associated with mobile source emissions is presented in Table 3-3. Appendix 3.1 presents the on-road emission rate calculation worksheets for the freeway segments considered in the assessment.

TABLE 3-3: COMPOUNDS EMITTED FROM ON-ROAD MOBILE SOURCE ACTIVITY

Source	Pollutant
Interstate 580 Freeway	Benzene Formaldehyde 1,3-Butadiene Acetaldehyde Acrolein Diesel Particulates Reentrained Particulates (PM_{10}, $PM_{2.5}$) Carbon Monoxide Nitrogen Dioxide

4 EXPOSURE QUANTIFICATION

In order to assess the impact of emitted compounds on individuals who would reside at the proposed Project, air quality modeling utilizing the AMS/EPA Regulatory Model AERMOD was performed to assess the downwind extent of mobile source emissions located within a ¼ mile radius of the project site. AERMOD's air dispersion algorithms are based upon a planetary boundary layer turbulence structure and scaling concepts, including the treatment of surface and elevated sources in simple and complex terrain.

The model offers additional flexibility by allowing the user to assign initial vertical and lateral dispersion parameters for sources representative of a localized mobile fleet. For this assessment, the volume source algorithm was utilized to model the emissions generated from on-road mobile source activity. Although the freeway is located in varied terrain, the assessment followed guidance promulgated by the U.S. Environmental Protection Agency (U.S. EPA, 2009) whereby the model was programmed to assume flat, level terrain. This was done as AERMOD will tend to underestimate pollutant concentrations in cases where receptor elevations are lower than the base elevation of the source and for conditions where the receptor elevations are higher than the base elevation of the source Therefore use of the flat, level terrain model options provides a conservative estimate of the anticipated concentrations. Notwithstanding, to account for the differences in terrain elevation, vertical (sigma z) dispersion parameters were developed for each source location by approximating mixing zone residence time and quantifying the initial vertical term as performed in the California Line Source Dispersion Model Caline3. The horizontal (sigma y) parameters were generated by dividing the source separation distance by a standard deviation of 2.15.

For PM_{10} and $PM_{2.5}$, plume depletion due to dry removal mechanisms was assumed (i.e., DRYDPLT). Entrained or fugitive PM_{10} emissions were separated into three aerodynamic diameter sizes of 1.0, 2.5 and 10 microns (µm) with weight fractions of 0.0787, 0.1292, and 0.7922, respectively. Fugitive $PM_{2.5}$ emissions were separated into two particle sizes of 1.0 and 2.5 µm with corresponding weight fractions of 0.3785 and 0.6215. Diesel particulate emissions were assigned particle size bins of 2.5 and 10 µm with corresponding weight fractions of 0.92 and 0.08. A particle density of 2.3 grams per cubic centimeter was assigned to all size bins.

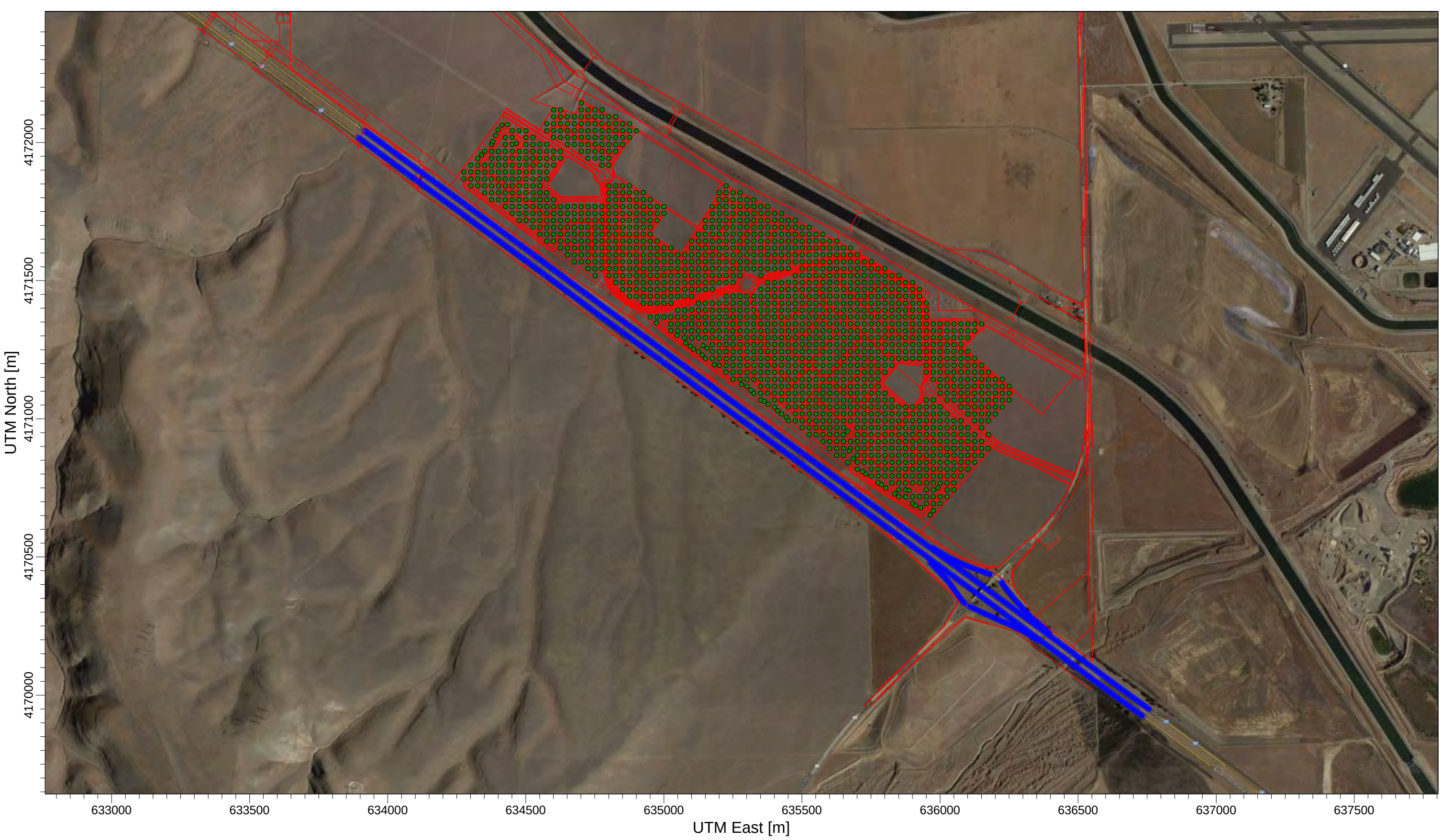
The model incorporates two methodologies to perform the NO_x to NO_2 conversion. In a recent clarification memorandum (U.S. EPA, 2011), the Office of Air Quality Planning and Standards provides guidance on the use and performance of the two algorithms referred to as the ozone limiting (OLM) and plume volume molar ratio (PVMRM) methods. Based upon this guidance, the OLM algorithm with the OLMGROUP ALL option was identified as the preferred method to perform the analysis because the OLM algorithm is recommended by US EPA since the PVMRM algorithm is not effectively validated for low level non buoyant sources such as roadways.

Air dispersion models require additional input parameters including pollutant emission data and local meteorology. Due to the their sensitivity to individual meteorological parameters such as wind speed and direction, the U.S. Environmental Protection Agency recommends that meteorological data used as input into dispersion models be selected on the basis of relative spatial and temporal conditions that exist in the area of concern. In response to this recommendation, meteorological data from the SJVAPCD Tracy monitoring station, which is the nearest available site with meteorological data to the project site, was used to represent local weather conditions and prevailing winds for modeling purposes. Five years (2004-2008) of available AERMOD meteorological data was utilized in the modeling.

The modeling analysis also considered the spatial distribution of mobile source activity traversing the freeway in relation to the proposed site. To accommodate a Cartesian grid format, direction dependent calculations were obtained by identifying the universal transverse mercator (UTM) coordinates for each volume source location. On-site receptors were placed to provide coverage across the identified project boundary. No flagpole receptor heights were assumed. A graphical representation of the source-receptor grid network is presented in Exhibit 4-A.

A dispersion model input summary table is provided in Appendix 4.1. A complete listing of model input/output files are provided in electronic format in Appendix 4.2.

EXHIBIT 4-A: SOURCE RECEPTOR GRID NETWORK



5 RISK CHARACTERIZATION

Carcinogenic compounds are not considered to have threshold levels (i.e., dose levels below which there are no risks). Any exposure, therefore, will have some associated risk. As a result, the State of California has established a threshold of one in one hundred thousand (or ten in one million) (1.0E-05) as a level posing no significant risk for exposures to carcinogens regulated under the Safe Drinking Water and Toxic Enforcement Act (Proposition 65). This threshold is also consistent with the maximum incremental cancer risk established by the SJVAPCD for CEQA purposes. The SJVAPCD *Guidance for Assessing and Mitigating Air Quality Impacts - Draft* (May 2012) states that emissions of TACs are considered significant if a health risk assessment shows an increased risk of greater than ten in one million.

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. Under a deterministic approach (i.e., point estimate methodology), the cancer risk probability is determined by multiplying the chemical's annual concentration by its unit risk factor (URF). The URF is a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It represents an upper bound estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter (μg/m3) over a 70 year lifetime. The URFs utilized in the assessment and corresponding cancer potency factor were obtained from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values*.

To effectively quantify dose, the procedure requires the incorporation of several discrete exposure variates. Once determined, contaminant dose is multiplied by the cancer potency factor (CPF) in units of inverse dose expressed in milligrams per kilogram per day $(mg/kg/day)^{-1}$ to derive the cancer risk estimate. Therefore, to assess exposures associated with the proposed residential population, the following dose algorithm was utilized.

$CDI = (C_{air} \times EF \times ED \times IR) / (BW \times AT)$

Where:

CDI = chronic daily intake (mg/kg/day)

C_{air} = concentration of contaminant in air (mg/m^3)

EF = exposure frequency (days/year)

ED = exposure duration (years)

IR = inhalation rate (m^3/day)

BW = body weight (kg)

AT = averaging time (days)

The SJVAPCD recommends utilizing a conservative exposure duration of 70 years to represent lifetime risk values. Notwithstanding, to more accurately represent residential exposures, the assessment employed the U.S. Environmental Protection Agency's guidance to develop viable dose estimates based on reasonable maximum exposures (RME). Specifically, activity patterns for population mobility recommended by the U.S. Environmental Protection Agency and presented in the *Exposure Factors Handbook*[2] were utilized. As a result, lifetime risk values for residents were adjusted to account for an exposure duration of 350 days per year for 30 years (i.e., 95th percentile). A 9 year exposure duration was additionally assessed to identify risk estimates associated with the average time individuals are reported to reside at a given residence. These values are consistent with CEQA which considers the evaluation of environmental effects of proposed projects in a manner that reflects both reasonable and feasible assumptions. For body weight and inhalation, the assessment employed average adult values of 70 kilograms and 20 cubic meters per day, respectively.

The risk estimate conservatively assumes sensitive receptors will be subject to DPM for 24 hours a day, 350 days a year. As a conservative measure, the SJVAPCD does not recognize indoor adjustments for residents. However, the typical person spends the majority of their time indoors rather than remaining outdoors for 24 hours a day.[3]

Appendix 5.1, Tables A1 through A6, columns f-g, present the URF's and corresponding cancer potency factors for carcinogens considered in the assessment. The cancer risk attributed to each compound and summation of those risks are presented in column h.

Without Project Design Feature

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor totaled 1.72E-05 (17.2 in one million) for the 70 year, 7.36E-06 (7.36 in one million) for the 30 year and 2.21E-06 (2.21 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of ten in one million, carcinogenic risks will exceed the applicable threshold for the 70 year exposure scenario only. Therefore, carcinogenic exposures have the potential to be significant without implementation of the air filtration project design feature (MERV 13 or equivalent air filtration system).

With Project Design Feature

With implementation of the applicable project design feature (MERV13 or equivalent air filtration system) the summation of carcinogenic risk for the maximum exposed residential receptor totaled 6.97E-06 (6.97 in one million) for the 70 year, 2.99E-06 (2.99 in one million) for the 30 year and 8.96E-07 (0.896 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of ten in one million, carcinogenic risks will not exceed the applicable thresholds for the 70, 30, or 9 year exposure scenario. Therefore, carcinogenic exposures are calculated to be within acceptable limits and are less than significant.

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[2] Table 15-176, Exposure Factors Handbook http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=12464

[3] In May, 1991 the California Air Resources Board (CARB) Research Division in association with the University of California, Berkeley published research findings entitled: *Activity Patterns of California Residents*. The findings of that study indicate that on average, adults and adolescents in California spent almost 15 hours per day inside their homes, and six hours in other indoor locations, for a total of 21 hours (87% of the day). About 2 hours per day were spent in transit, and just over 1 hour per day was spent in outdoor locations.

5.1 NON-CARCINOGENIC HAZARDS

An evaluation of the potential noncancer effects of contaminant exposures was also conducted. Under the point estimate approach, adverse health effects are evaluated by comparing the concentration of each compound with the appropriate Reference Exposure Level (REL). Available REL's presented in the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* were considered in the assessment.

To quantify noncarcinogenic impacts, the hazard index approach was used. The hazard index assumes that subthreshold exposures adversely affect a specific organ or organ system (i.e., toxicological endpoint). For each discrete pollutant exposure, target organs presented in regulatory guidance were utilized.

To calculate the hazard index, the pollutant 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 (i.e., unity), a health hazard is presumed to exist. For chronic exposures, REL's were converted to units expressed in mg/kg/day to accommodate the above referenced intake algorithm. To assess acute noncancer impacts, the maximum pollutant concentration is divided by the REL for the corresponding averaging time (e.g., 1-hour). No exposure adjustments are considered for short duration exposures.

Appendix 5.1, Tables A1 through A6, columns i-j, present the REL's and corresponding reference dose values used in the evaluation of chronic noncarcinogenic exposures. The noncancer hazard quotient for identified compounds generated from each source and a summation for each toxicological endpoint are presented in columns k-r. Tables A7 and A8, column e present the REL's for the assessment of acute exposures. Columns f-m identify each compound's hazard quotient and corresponding index for each endpoint.

Without and With Project Design Feature

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for the 70, 30 and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed the threshold of 1.0. Therefore, noncarcinogenic hazards are calculated to be within acceptable limits and a less than significant impact would occur.

5.2 CRITERIA POLLUTANT EXPOSURES

The State of California has promulgated strict ambient air quality standards for various pollutants. These standards were established to safeguard the public's health and welfare with specific emphasis on protecting those individuals susceptible to respiratory distress, such as asthmatics, the young, the elderly and those with existing conditions which may be affected by increased pollutant concentrations. However, recent research has shown that unhealthful respiratory responses occur with exposures to pollutants at levels that only marginally exceed clean air standards. Table 5-1 presents the California Ambient Air Quality Standards (CAAQS) for the criteria pollutants considered in the assessment.

TABLE 5-1: CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Standard	Health Effects
Particulates (PM_{10})	>50 µg/m3 (24 hr avg.) >20 µg/m3 (Annual)	1) Excess deaths from short-term exposures and the exacerbation of symptoms in sensitive individuals with respiratory disease. 2) Excess seasonal declines in pulmonary function especially in children.
Particulates ($PM_{2.5}$)	>12 µg/m3 (Annual)	1) Excess deaths and illness from long-term exposures and the exacerbation of symptoms in sensitive individuals with respiratory and cardio pulmonary disease.
Carbon Monoxide (CO)	>9.0 ppm (8 hr avg.) >20.0 ppm (1 hr avg.)	1) Aggravation of angina pectoris and other aspects of coronary heart disease. 2) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease. 3) Impairment of central nervous system functions. 4) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	>0.18 ppm (1 hr avg.)	1) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups. 2) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes.

Abbreviations: ppm: parts per million; µg/m^3: micrograms per cubic meter.
Source: California Code of Regulations, Title 17, Section 70200.

Pollutant emissions are considered to have a significant effect on the environment if they result in concentrations that create either a violation of an ambient air quality standard, contribute to an existing air quality violation or expose sensitive receptors to substantive pollutant concentrations. Should ambient air quality already exceed existing standards, the SJVAPCD has established significance criteria for selected compounds to account for the continued degradation of local air quality. Background concentrations are based upon the highest observed value for the most recent three year period.

For PM_{10} emissions, background concentrations representative of the project area exceed the CAAQS for the 24-hour and annual averaging times. As a result, a significant impact is achieved when pollutant concentrations produce a measurable change over existing background levels. Although background concentrations exceed the CAAQS annual averaging time for fine particulates, no measurable change criteria currently exists. As a result, the SCAQMD significance threshold of 2.5 $\mu g/m^3$ for the 24-hour averaging time is used to assess $PM_{2.5}$ impacts.

For the CO 1 and 8-hour averaging times and NO_2 1-hour averaging time, background concentrations are below the current air quality standards. As such, significance is achieved when pollutant concentrations add to existing levels and create an exceedance of the CAAQS. Table 5-2 shows the pollutant concentrations collected at the nearest available monitoring sites to the Project for the last three years of available data. Table 5-3 outlines the relevant significance thresholds considered to affect local air quality.

TABLE 5-2: TRACY/STOCKTON MONITORING SUMMARY

Pollutant/Averaging Time	2010	2011	2012	Maximum
Particulates (PM_{10}) 24-Hour	54.3	66.1	69.4	69.4
Particulates ($PM_{2.5}$) 24-Hour	41.0	60.0	60.4	60.4
Particulates (PM_{10}) Annual	19.9	24.1	22.8	24.1
Particulates ($PM_{2.5}$) Annual	10.9	11.3	12.3	12.3
Carbon Monoxide (CO) 1-Hour	2.8	3.2	3.0	3.2
Carbon Monoxide (CO) 8-Hour	1.6	2.1	1.8	2.1
Nitrogen Dioxide (NO_2) 1-Hour	0.040	0.039	0.040	0.040

Note: PM_{10} concentrations are expressed in micrograms per cubic meter ($\mu g/m^3$). All others are expressed in parts per million (ppm).

Source: U.S Environmental Protection Agency and California Air Resources Board.

TABLE 5-3: SJVAPCD AIR QUALITY SIGNIFICANCE THRESHOLDS

Pollutant	Averaging Time	Pollutant Concentration
Particulates (PM_{10})	24-Hours	10.4 µg/m3
Particulates (PM_{10})	Annual	2.08 µg/m3
Particulates ($PM_{2.5}$)	24-Hours	2.5 µg/m3
Particulates ($PM_{2.5}$)	Annual	0.63 µg/m3
Carbon Monoxide (CO)	1/8-Hours	San Joaquin County is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standards 20 ppm (1-hour) and 9 ppm (8-hour).
Nitrogen Dioxide (NO_2)	1-Hour	San Joaquin County is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standard 0.18 ppm.

Abbreviations: ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
Source: San Joaquin Valley Air Pollution Control District.

Without Project Design Feature

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM_{10} concentrations of 4.87μg/m^3 and 1.26 μg/m^3 for the 24-hour and annual averaging times. These values will not exceed the SJVAPCD significance thresholds of 10.4 μg/m^3 and 2.8 μg/m^3, respectively. For $PM_{2.5}$, concentrations of 1.97 μg/m^3 and 0.57 μg/m^3 for the 24-hour and annual averaging times were predicted. These values will not exceed the SJVAPCD significance thresholds of 2.5 μg/m^3 and 0.63 μg/m^3, respectively

The maximum modeled 1-hour average concentration for CO of 0.03 parts per million (ppm) (29.9571 μg/m^3) when added to an existing background concentration of 3.2 ppm totals 3.23 ppm and will not cause an exceedance of the CAAQS of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.02 ppm, (19.2567 μg/m^3) when added to an existing background level of 2.1 ppm totals 2.12 ppm and does not cause an exceedance of the CAAQS of 9 ppm.

For NO_2, a maximum one hour concentration of 0.014 ppm (25.8147 μg/m^3) was predicted. This concentration, when added to a background concentration of 0.04 ppm totals 0.054 ppm and will not cause an exceedance of the CAAQS of 0.18 ppm.

With Project Design Feature

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM_{10} concentrations of 0.5 μg/m^3 and 0.13 μg/m^3 for the 24-hour and annual averaging times. These values will not exceed the SJVAPCD significance thresholds of 10.4 μg/m^3 and 2.8 μg/m^3, respectively. For $PM_{2.5}$, concentrations of 0.20 μg/m^3 and 0.06 μg/m^3 for the 24-hour and annual averaging times were predicted. These values will not exceed the SJVAPCD significance thresholds of 2.5 μg/m^3 and 0.63 μg/m^3, respectively

The maximum modeled 1-hour average concentration for CO of 0.03 parts per million (ppm) (29.9571 μg/m^3) when added to an existing background concentration of 3.2 ppm totals 3.23 ppm and will not cause an exceedance of the CAAQS of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.02 ppm, (19.2567 μg/m^3) when added to an existing background level of 2.1 ppm totals 2.12 ppm and does not cause an exceedance of the CAAQS of 9 ppm.

For NO_2, a maximum one hour concentration of 0.014 ppm (25.8147 μg/m^3) was predicted. This concentration, when added to a background concentration of 0.04 ppm totals 0.054 ppm and will not cause an exceedance of the CAAQS of 0.18 ppm.

6 REFERENCES

There are no sources in the current document.

7 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Tracy Hills Phase 1 Project. The information contained in this health risk assessment report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 660-1994 ext. 217.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

APPENDIX 3.1:

EMISSION RATE CALCULATIONS

Running Rate Emission Summary

Criteria	5 mph	45 mph	70 mph
CO	2.311	1.217	2.286
NOx	0.425	0.204	0.267
PM10	0.015	0.003	0.005
PM2.5	0.014	0.003	0.005
TOG GAS	0.323	0.084	0.195
TOG DSL	1.248	0.112	0.095
DSL Particulate	0.071	0.037	0.064

TW/BW Emission Summary

	TW	BW	Total
PM10	0.009	0.040	0.048
PM2.5	0.002	0.017	0.019

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)	PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	5	837.1157869	0.0015	0.224509859	0.00033865	0.395689367	0.00059686	0.01819691	0.00002745	0.007999959	0.00001207	0.036749815	0.000055434	0.016741157	0.000025253	0.00199999	0.000003017	0.01574992	0.000023757
San Joaquin	2025	Annual	LDA	GAS	Aggregated	5	260852.5257	0.4700	1.161947683	0.54615490	0.110954361	0.05215232	0.012662305	0.00595171	0.007999959	0.00376025	0.036749816	0.017273662	0.01174853	0.005522209	0.00199999	0.000940063	0.01574992	0.007402998
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	5	49.85401761	0.0001	0.341072232	0.00003064	0.458648904	0.00004120	0.041505469	0.00000373	0.007999958	0.00000072	0.036749814	0.000003301	0.038185029	0.000003430	0.00199999	0.000000180	0.015749919	0.000001415
San Joaquin	2025	Annual	LDT1	GAS	Aggregated	5	38406.28141	0.0692	2.348282425	0.16251251	0.234033404	0.01619624	0.015998948	0.00110720	0.007999959	0.00055364	0.036749816	0.002543265	0.014844385	0.001027303	0.00199999	0.000138409	0.01574992	0.001089971
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	5	45.8314763	0.0001	0.282684668	0.00002335	0.49109583	0.00004056	0.024314549	0.00000201	0.007999959	0.00000066	0.036749816	0.000003035	0.022369386	0.000001847	0.00199999	0.000000165	0.01574992	0.000001301
San Joaquin	2025	Annual	LDT2	GAS	Aggregated	5	88492.32042	0.1595	1.476709798	0.23546966	0.158626923	0.02529395	0.01267054	0.00202039	0.007999958	0.00127564	0.036749816	0.005859964	0.011756171	0.001874587	0.00199999	0.000318910	0.015749921	0.002511413
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	5	10333.71435	0.0186	2.467258479	0.04594152	2.757317507	0.05134255	0.06383004	0.00118855	0.011999938	0.00022344	0.076439598	0.001423341	0.058723639	0.001093462	0.002999984	0.000055861	0.032759825	0.000610003
San Joaquin	2025	Annual	LHD1	GAS	Aggregated	5	14993.67828	0.0270	2.269811697	0.06132425	0.1738895	0.00469803	0.003419976	0.00009240	0.007999959	0.00021614	0.036749816	0.000992882	0.003173173	0.000085731	0.00199999	0.000054034	0.01574992	0.000425521
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	5	2341.407554	0.0042	2.319050624	0.00978411	2.461251531	0.01038406	0.059575297	0.00025135	0.011999938	0.00005063	0.089179531	0.000376250	0.054809276	0.000231241	0.002999985	0.000012657	0.038219796	0.000161250
San Joaquin	2025	Annual	LHD2	GAS	Aggregated	5	1043.347694	0.0019	1.155878285	0.00217308	0.12338535	0.00023197	0.002164673	0.00000407	0.007999958	0.00001504	0.036749815	0.000069091	0.00200846	0.000003776	0.00199999	0.000003760	0.015749919	0.000029610
San Joaquin	2025	Annual	MCY	GAS	Aggregated	5	15453.01288	0.0278	23.91548499	0.66592692	1.232269958	0.03431257	0.000498346	0.00001388	0.007999958	0.00022276	0.036749815	0.001023299	0.000434658	0.000012103	0.00199999	0.000055690	0.015749919	0.000438557
San Joaquin	2025	Annual	MDV	DSL	Aggregated	5	80.772776	0.0001	0.194820261	0.00002836	0.345944929	0.00005035	0.020584262	0.00000300	0.007999959	0.00000116	0.036749816	0.000005349	0.01893752	0.000002756	0.00199999	0.000000291	0.01574992	0.000002292
San Joaquin	2025	Annual	MDV	GAS	Aggregated	5	101688.1479	0.1832	2.390471067	0.43801405	0.305311934	0.05594333	0.013435299	0.00246180	0.007999959	0.00146586	0.036749816	0.006733792	0.012465633	0.002284120	0.00199999	0.000366465	0.01574992	0.002885911
San Joaquin	2025	Annual	MH	DSL	Aggregated	5	711.4130897	0.0013	2.121119112	0.00271907	13.56384366	0.01738757	0.279852907	0.00035875	0.011999938	0.00001538	0.130339311	0.000167083	0.257464684	0.000330045	0.002999984	0.000003846	0.055859693	0.000071607
San Joaquin	2025	Annual	MH	GAS	Aggregated	5	3474.943454	0.0063	2.611595347	0.01635264	0.228643115	0.00143166	0.002964036	0.00001856	0.007999958	0.00005009	0.036749817	0.000230111	0.002750136	0.000017220	0.00199999	0.000012523	0.01574992	0.000098619
San Joaquin	2025	Annual	T6	DSL	Aggregated	5	6329.700489	0.0114	1.934564292	0.02206483	3.439762736	0.03923249	0.041811107	0.00047688	0.011999937	0.00013687	0.130339319	0.001486596	0.038466219	0.000438730	0.002999984	0.000034217	0.055859708	0.000637112
San Joaquin	2025	Annual	T6	GAS	Aggregated	5	956.161997	0.0017	2.791093627	0.00480884	0.206058414	0.00035502	0.0017248	0.00000297	0.007999959	0.00001378	0.036749816	0.000063317	0.00160033	0.000002757	0.00199999	0.000003446	0.01574992	0.000027136
San Joaquin	2025	Annual	T7	DSL	Aggregated	5	7849.928253	0.0141	5.036687358	0.07124344	6.65668776	0.09415819	0.076471526	0.00108168	0.035827214	0.00050677	0.061443671	0.000869115	0.070353804	0.000995148	0.008956803	0.000126693	0.026333002	0.000372478
San Joaquin	2025	Annual	T7	GAS	Aggregated	5	63.0284228	0.0001	115.8738151	0.01316000	3.300198425	0.00037481	0.001276615	0.00000014	0.007999959	0.00000091	0.036749815	0.000004174	0.001184489	0.000000135	0.00199999	0.000000227	0.01574992	0.000001789
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	5	142.5197392	0.0003	3.441441501	0.00088379	4.912556822	0.00126159	0.058166931	0.00001494	0.011999937	0.00000308	0.130339319	0.000033472	0.053513576	0.000013743	0.002999984	0.000000770	0.055859708	0.000014345
San Joaquin	2025	Annual	OBUS	GAS	Aggregated	5	247.5474439	0.0004	3.889445557	0.00173492	0.313748573	0.00013995	0.001607714	0.00000072	0.007999958	0.00000357	0.036749816	0.000016393	0.001491693	0.000000665	0.00199999	0.000000892	0.015749919	0.000007025
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	5	274.5299128	0.0005	2.480965498	0.00122728	22.37352721	0.01106772	0.18670556	0.00009236	0.011999937	0.00000594	0.744796108	0.000368435	0.171769115	0.000084971	0.002999984	0.000001484	0.319198332	0.000157901
San Joaquin	2025	Annual	SBUS	GAS	Aggregated	5	62.14188755	0.0001	30.73064466	0.00344104	1.038438577	0.00011628	0.014893516	0.00000167	0.007999958	0.00000090	0.036749815	0.000004115	0.013818727	0.000001547	0.00199999	0.000000224	0.01574992	0.000001764
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	5	195.9016057	0.0004	7.805768607	0.00275542	21.79702837	0.00769431	0.594657294	0.00020991	0.007999959	0.00000282	0.84181568	0.000297159	0.547084706	0.000193120	0.00199999	0.000000706	0.360778124	0.000127354
San Joaquin	2025	Annual	UBUS	GAS	Aggregated	5	39.4192171	0.0001	45.05006109	0.00319991	3.52118167	0.00025011	0.003995187	0.00000028	0.007999958	0.00000057	0.036749815	0.000002610	0.003706874	0.000000263	0.00199999	0.000000142	0.01574992	0.000001119
							554965.2	1.0		2.311		0.425		0.015		0.009		0.040		0.014		0.002		0.017

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	GAS	Aggregated	5	260852.5257	0.4961	0.126212428	0.0626
San Joaquin	2025	Annual	LDT1	GAS	Aggregated	5	38406.28141	0.0730	0.230483803	0.0168
San Joaquin	2025	Annual	LDT2	GAS	Aggregated	5	88492.32042	0.1683	0.160723089	0.0271
San Joaquin	2025	Annual	LHD1	GAS	Aggregated	5	14993.67828	0.0285	0.21247938	0.0061
San Joaquin	2025	Annual	LHD2	GAS	Aggregated	5	1043.347694	0.0020	0.114986339	0.0002
San Joaquin	2025	Annual	MCY	GAS	Aggregated	5	15453.01288	0.0294	5.167476169	0.1519
San Joaquin	2025	Annual	MDV	GAS	Aggregated	5	101688.1479	0.1934	0.28624964	0.0554
San Joaquin	2025	Annual	MH	GAS	Aggregated	5	3474.943454	0.0066	0.213919689	0.0014
San Joaquin	2025	Annual	T6	GAS	Aggregated	5	956.161997	0.0018	0.258607149	0.0005
San Joaquin	2025	Annual	T7	GAS	Aggregated	5	63.0284228	0.0001	3.20272495	0.0004
San Joaquin	2025	Annual	OBUS	GAS	Aggregated	5	247.5474439	0.0005	0.349027344	0.0002
San Joaquin	2025	Annual	SBUS	GAS	Aggregated	5	62.14188755	0.0001	2.82010066	0.0003
San Joaquin	2025	Annual	UBUS	GAS	Aggregated	5	39.4192171	0.0001	4.111012706	0.0003
							525772.6	1.0		0.323

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	5	837.1157869	0.0287	0.032248426	0.0009
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	5	49.85401761	0.0017	0.063885254	0.0001
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	5	45.8314763	0.0016	0.042846643	0.0001
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	5	10333.71435	0.3540	0.313308341	0.1109
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	5	2341.407554	0.0802	0.28062535	0.0225
San Joaquin	2025	Annual	MDV	DSL	Aggregated	5	80.772776	0.0028	0.033597121	0.0001
San Joaquin	2025	Annual	MH	DSL	Aggregated	5	711.4130897	0.0244	1.459675433	0.0356
San Joaquin	2025	Annual	T6	DSL	Aggregated	5	6329.700489	0.2168	1.242704091	0.2694
San Joaquin	2025	Annual	T7	DSL	Aggregated	5	7849.928253	0.2689	2.871114654	0.7720
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	5	142.5197392	0.0049	2.037931171	0.0099
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	5	274.5299128	0.0094	1.752373992	0.0165
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	5	195.9016057	0.0067	1.515972669	0.0102
							29192.7	1.0		1.248

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	5	837.1157869	0.0287	0.01819691	0.0005
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	5	49.85401761	0.0017	0.041505469	0.0001
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	5	45.8314763	0.0016	0.024314549	0.0000
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	5	10333.71435	0.3540	0.06383004	0.0226
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	5	2341.407554	0.0802	0.059575297	0.0048
San Joaquin	2025	Annual	MDV	DSL	Aggregated	5	80.772776	0.0028	0.020584262	0.0001
San Joaquin	2025	Annual	MH	DSL	Aggregated	5	711.4130897	0.0244	0.279852907	0.0068
San Joaquin	2025	Annual	T6	DSL	Aggregated	5	6329.700489	0.2168	0.041811107	0.0091
San Joaquin	2025	Annual	T7	DSL	Aggregated	5	7849.928253	0.2689	0.076471526	0.0206
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	5	142.5197392	0.0049	0.058166931	0.0003
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	5	274.5299128	0.0094	0.18670556	0.0018
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	5	195.9016057	0.0067	0.594657294	0.0040
							29192.7	1.0		0.071

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	45	837.1157869	0.0015	0.077356908	0.00011669	0.267795997	0.00040395	0.005727374	0.00000864
San Joaquin	2025	Annual	LDA	GAS	Aggregated	45	260852.5257	0.4700	0.582853851	0.27396112	0.056308512	0.02646691	0.001405071	0.00066043
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	45	49.85401761	0.0001	0.104080365	0.00000935	0.310502546	0.00002789	0.012195801	0.00000110
San Joaquin	2025	Annual	LDT1	GAS	Aggregated	45	38406.28141	0.0692	1.094543371	0.07574770	0.112242927	0.00776775	0.00187196	0.00012955
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	45	45.8314763	0.0001	0.095460172	0.00000788	0.331610511	0.00002739	0.007442065	0.00000061
San Joaquin	2025	Annual	LDT2	GAS	Aggregated	45	88492.32042	0.1595	0.736554118	0.11744768	0.079624997	0.01269665	0.001407749	0.00022447
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	45	10333.71435	0.0186	0.46026399	0.00857033	1.626196021	0.03028054	0.017769332	0.00033087
San Joaquin	2025	Annual	LHD1	GAS	Aggregated	45	14993.67828	0.0270	0.40011584	0.01081006	0.249977013	0.00675371	0.000394779	0.00001067
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	45	2341.407554	0.0042	0.432616	0.00182521	1.451583922	0.00612426	0.016584876	0.00006997
San Joaquin	2025	Annual	LHD2	GAS	Aggregated	45	1043.347694	0.0019	0.203866769	0.00038327	0.177339788	0.00033340	0.000249875	0.00000047
San Joaquin	2025	Annual	MCY	GAS	Aggregated	45	15453.01288	0.0278	17.47315315	0.48654013	1.174576818	0.03270610	0.000205396	0.00000572
San Joaquin	2025	Annual	MDV	DSL	Aggregated	45	80.772776	0.0001	0.073466214	0.00001069	0.240239171	0.00003497	0.006422711	0.00000093
San Joaquin	2025	Annual	MDV	GAS	Aggregated	45	101688.1479	0.1832	1.17882661	0.21600036	0.149449018	0.02738405	0.001513643	0.00027735
San Joaquin	2025	Annual	MH	DSL	Aggregated	45	711.4130897	0.0013	0.440026662	0.00056407	4.604704445	0.00590280	0.088950451	0.00011403
San Joaquin	2025	Annual	MH	GAS	Aggregated	45	3474.943454	0.0063	0.470395567	0.00294541	0.314884077	0.00197166	0.000342148	0.00000214
San Joaquin	2025	Annual	T6	DSL	Aggregated	45	6329.700489	0.0114	0.336666063	0.00383987	0.939379727	0.01071417	0.035915127	0.00040963
San Joaquin	2025	Annual	T6	GAS	Aggregated	45	956.161997	0.0017	0.502677782	0.00086607	0.283783428	0.00048894	0.000199099	0.00000034
San Joaquin	2025	Annual	T7	DSL	Aggregated	45	7849.928253	0.0141	0.879790981	0.01244456	1.820242023	0.02574714	0.066319323	0.00093808
San Joaquin	2025	Annual	T7	GAS	Aggregated	45	63.0284228	0.0001	20.88237053	0.00237165	4.539659509	0.00051558	0.000147364	0.00000002
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	45	142.5197392	0.0003	0.598934982	0.00015381	1.335031363	0.00034285	0.050784955	0.00001304
San Joaquin	2025	Annual	OBUS	GAS	Aggregated	45	247.5474439	0.0004	0.700439587	0.00031244	0.432103281	0.00019274	0.000185584	0.00000008
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	45	274.5299128	0.0005	0.41602892	0.00020580	6.743904287	0.00333607	0.043994889	0.00002176
San Joaquin	2025	Annual	SBUS	GAS	Aggregated	45	62.14188755	0.0001	5.511930603	0.00061719	1.440522429	0.00016130	0.001719207	0.00000019
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	45	195.9016057	0.0004	1.045884568	0.00036920	9.880110572	0.00348766	0.125663841	0.00004436
San Joaquin	2025	Annual	UBUS	GAS	Aggregated	45	39.4192171	0.0001	8.102315201	0.00057551	4.859878907	0.00034520	0.000461177	0.00000003
							554965.2	1.0		1.217		0.204		0.003

Veh_Class	Fuel	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)	PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
LDA	DSL	0.007999959	0.00001207	0.036749815	0.000055434	0.005269184	0.000007948	0.00199999	0.000003017	0.01574992	0.000023757
LDA	GAS	0.007999959	0.00376025	0.036749816	0.017273662	0.001303674	0.000612771	0.00199999	0.000940063	0.01574992	0.007402998
LDT1	DSL	0.007999958	0.00000072	0.036749814	0.000003301	0.011220136	0.000001008	0.00199999	0.000000180	0.015749919	0.000001415
LDT1	GAS	0.007999959	0.00055364	0.036749816	0.002543265	0.00173687	0.000120200	0.00199999	0.000138409	0.01574992	0.001089971
LDT2	DSL	0.007999959	0.00000066	0.036749816	0.000003035	0.006846701	0.000000565	0.00199999	0.000000165	0.01574992	0.000001301
LDT2	GAS	0.007999958	0.00127564	0.036749816	0.005859964	0.001306159	0.000208274	0.00199999	0.000318910	0.015749921	0.002511413
LHD1	DSL	0.011999938	0.00022344	0.076439598	0.001423341	0.016347786	0.000304403	0.002999984	0.000055861	0.032759825	0.000610003
LHD1	GAS	0.007999959	0.00021614	0.036749816	0.000992882	0.00036629	0.000009896	0.00199999	0.000054034	0.01574992	0.000425521
LHD2	DSL	0.011999938	0.00005063	0.089179531	0.000376250	0.015258087	0.000064374	0.002999985	0.000012657	0.038219796	0.000161250
LHD2	GAS	0.007999958	0.00001504	0.036749815	0.000069091	0.000231843	0.000000436	0.00199999	0.000003760	0.015749919	0.000029610
MCY	GAS	0.007999958	0.00022276	0.036749815	0.001023299	0.000176291	0.000004909	0.00199999	0.000055690	0.015749919	0.000438557
MDV	DSL	0.007999959	0.00000116	0.036749816	0.000005349	0.005908894	0.000000860	0.00199999	0.000000291	0.01574992	0.000002292
MDV	GAS	0.007999959	0.00146586	0.036749816	0.006733792	0.00140439	0.000257331	0.00199999	0.000366465	0.01574992	0.002885911
MH	DSL	0.011999938	0.00001538	0.130339311	0.000167083	0.081834414	0.000104904	0.002999984	0.000003846	0.055859693	0.000071607
MH	GAS	0.007999958	0.00005009	0.036749817	0.000230111	0.000317457	0.000001988	0.00199999	0.000012523	0.01574992	0.000098619
T6	DSL	0.011999937	0.00013687	0.130339319	0.001486596	0.033041917	0.000376862	0.002999984	0.000034217	0.055859708	0.000637112
T6	GAS	0.007999959	0.00001378	0.036749816	0.000063317	0.000184731	0.000000318	0.00199999	0.000003446	0.01574992	0.000027136
T7	DSL	0.035827214	0.00050677	0.061443671	0.000869115	0.061013778	0.000863034	0.008956803	0.000126693	0.026333002	0.000372478
T7	GAS	0.007999959	0.00000091	0.036749815	0.000004174	0.000136729	0.000000016	0.00199999	0.000000227	0.01574992	0.000001789
OBUS	DSL	0.011999937	0.00000308	0.130339319	0.000033472	0.046722159	0.000011999	0.002999984	0.000000770	0.055859708	0.000014345
OBUS	GAS	0.007999958	0.00000357	0.036749816	0.000016393	0.000172191	0.000000077	0.00199999	0.000000892	0.015749919	0.000007025
SBUS	DSL	0.011999937	0.00000594	0.744796108	0.000368435	0.040475298	0.000020022	0.002999984	0.000001484	0.319198332	0.000157901
SBUS	GAS	0.007999958	0.00000090	0.036749815	0.000004115	0.001595141	0.000000179	0.00199999	0.000000224	0.01574992	0.000001764
UBUS	DSL	0.007999959	0.00000282	0.84181568	0.000297159	0.115610731	0.000040810	0.00199999	0.000000706	0.360778124	0.000127354
UBUS	GAS	0.007999958	0.00000057	0.036749815	0.000002610	0.000427897	0.000000030	0.00199999	0.000000142	0.01574992	0.000001119
			0.009		0.040		0.003		0.002		0.017

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	GAS	Aggregated	45	260852.5257	0.4961	0.014197217	0.0070
San Joaquin	2025	Annual	LDT1	GAS	Aggregated	45	38406.28141	0.0730	0.028582016	0.0021
San Joaquin	2025	Annual	LDT2	GAS	Aggregated	45	88492.32042	0.1683	0.018234747	0.0031
San Joaquin	2025	Annual	LHD1	GAS	Aggregated	45	14993.67828	0.0285	0.024064581	0.0007
San Joaquin	2025	Annual	LHD2	GAS	Aggregated	45	1043.347694	0.0020	0.013031	0.0000
San Joaquin	2025	Annual	MCY	GAS	Aggregated	45	15453.01288	0.0294	2.197485862	0.0646
San Joaquin	2025	Annual	MDV	GAS	Aggregated	45	101688.1479	0.1934	0.03339511	0.0065
San Joaquin	2025	Annual	MH	GAS	Aggregated	45	3474.943454	0.0066	0.024728104	0.0002
San Joaquin	2025	Annual	T6	GAS	Aggregated	45	956.161997	0.0018	0.029893943	0.0001
San Joaquin	2025	Annual	T7	GAS	Aggregated	45	63.0284228	0.0001	0.370654029	0.0000
San Joaquin	2025	Annual	OBUS	GAS	Aggregated	45	247.5474439	0.0005	0.04033924	0.0000
San Joaquin	2025	Annual	SBUS	GAS	Aggregated	45	62.14188755	0.0001	0.324526862	0.0000
San Joaquin	2025	Annual	UBUS	GAS	Aggregated	45	39.4192171	0.0001	0.474547593	0.0000
							525772.6	1.0		0.084

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	45	837.1157869	0.0287	0.010211548	0.0003
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	45	49.85401761	0.0017	0.019200729	0.0000
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	45	45.8314763	0.0016	0.013421068	0.0000
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	45	10333.71435	0.3540	0.087220375	0.0309
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	45	2341.407554	0.0802	0.078121923	0.0063
San Joaquin	2025	Annual	MDV	DSL	Aggregated	45	80.772776	0.0028	0.010643844	0.0000
San Joaquin	2025	Annual	MH	DSL	Aggregated	45	711.4130897	0.0244	0.106638114	0.0026
San Joaquin	2025	Annual	T6	DSL	Aggregated	45	6329.700489	0.2168	0.081029131	0.0176
San Joaquin	2025	Annual	T7	DSL	Aggregated	45	7849.928253	0.2689	0.188603869	0.0507
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	45	142.5197392	0.0049	0.132949073	0.0006
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	45	274.5299128	0.0094	0.100032884	0.0009
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	45	195.9016057	0.0067	0.320357524	0.0021
							29192.7	1.0		0.112

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	45	837.1157869	0.0287	0.005727374	0.0002
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	45	49.85401761	0.0017	0.012195801	0.0000
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	45	45.8314763	0.0016	0.007442065	0.0000
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	45	10333.71435	0.3540	0.017769332	0.0063
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	45	2341.407554	0.0802	0.016584876	0.0013
San Joaquin	2025	Annual	MDV	DSL	Aggregated	45	80.772776	0.0028	0.006422711	0.0000
San Joaquin	2025	Annual	MH	DSL	Aggregated	45	711.4130897	0.0244	0.088950451	0.0022
San Joaquin	2025	Annual	T6	DSL	Aggregated	45	6329.700489	0.2168	0.035915127	0.0078
San Joaquin	2025	Annual	T7	DSL	Aggregated	45	7849.928253	0.2689	0.066319323	0.0178
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	45	142.5197392	0.0049	0.050784955	0.0002
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	45	274.5299128	0.0094	0.043994889	0.0004
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	45	195.9016057	0.0067	0.125663841	0.0008
							29192.7	1.0		0.037

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)	PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	70	837.1157869	0.0015	0.072036122	0.00010866	0.413321462	0.00062346	0.010756008	0.00001622	0.007999959	0.00001207	0.036749815	0.000055434	0.009895528	0.000014927	0.00199999	0.000003017	0.01574992	0.000023757
San Joaquin	2025	Annual	LDA	GAS	Aggregated	70	260852.5257	0.4700	0.438271668	0.20600258	0.061211719	0.02877159	0.001815041	0.00085313	0.007999959	0.00376025	0.036749816	0.017273662	0.001684059	0.000791565	0.00199999	0.000940063	0.01574992	0.007402998
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	70	49.85401761	0.0001	0.103617418	0.00000931	0.478875437	0.00004302	0.016059272	0.00000144	0.007999958	0.00000072	0.036749814	0.000003301	0.01477453	0.000001327	0.00199999	0.000000180	0.015749919	0.000001415
San Joaquin	2025	Annual	LDT1	GAS	Aggregated	70	38406.28141	0.0692	0.874311621	0.06050660	0.132903367	0.00919756	0.002337467	0.00016176	0.007999959	0.00055364	0.036749816	0.002543265	0.002168784	0.000150090	0.00199999	0.000138409	0.01574992	0.001089971
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	70	45.8314763	0.0001	0.089861476	0.00000742	0.514628991	0.00004250	0.012313612	0.00000102	0.007999959	0.00000066	0.036749816	0.000003035	0.011328523	0.000000936	0.00199999	0.000000165	0.01574992	0.000001301
San Joaquin	2025	Annual	LDT2	GAS	Aggregated	70	88492.32042	0.1595	0.555740993	0.08861602	0.087850455	0.01400825	0.001817051	0.00028974	0.007999958	0.00127564	0.036749816	0.005859964	0.001685924	0.000268830	0.00199999	0.000318910	0.015749921	0.002511413
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	70	10333.71435	0.0186	0.772985467	0.01439335	3.312430776	0.06167902	0.017694378	0.00032948	0.011999938	0.00022344	0.076439598	0.001423341	0.016278828	0.000303119	0.002999984	0.000055861	0.032759825	0.000610003
San Joaquin	2025	Annual	LHD1	GAS	Aggregated	70	14993.67828	0.0270	0.894898022	0.02417775	0.349685472	0.00944757	0.000322778	0.00000872	0.007999959	0.00021614	0.036749816	0.000992882	0.000299485	0.000008091	0.00199999	0.000054034	0.01574992	0.000425521
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	70	2341.407554	0.0042	0.72060191	0.00304023	3.094167114	0.01305434	0.016430307	0.00006932	0.011999938	0.00005063	0.089179531	0.000376250	0.015115883	0.000063774	0.002999985	0.000012657	0.038219796	0.000161250
San Joaquin	2025	Annual	LHD2	GAS	Aggregated	70	1043.347694	0.0019	0.358868233	0.00067468	0.230081362	0.00043256	0.000190004	0.00000036	0.007999958	0.00001504	0.036749815	0.000069091	0.000176292	0.000000331	0.00199999	0.000003760	0.015749919	0.000029610
San Joaquin	2025	Annual	MCY	GAS	Aggregated	70	15453.01288	0.0278	60.53507683	1.68559983	1.468032982	0.04087739	0.000543064	0.00001512	0.007999958	0.00022276	0.036749815	0.001023299	0.000465949	0.000012974	0.00199999	0.000055690	0.015749919	0.000438557
San Joaquin	2025	Annual	MDV	DSL	Aggregated	70	80.772776	0.0001	0.065254624	0.00000950	0.348011026	0.00005065	0.011619637	0.00000169	0.007999959	0.00000116	0.036749816	0.000005349	0.010690066	0.000001556	0.00199999	0.000000291	0.01574992	0.000002292
San Joaquin	2025	Annual	MDV	GAS	Aggregated	70	101688.1479	0.1832	0.898951961	0.16471799	0.171191164	0.03136793	0.00193679	0.00035488	0.007999959	0.00146586	0.036749816	0.006733792	0.001796991	0.000329269	0.00199999	0.000366465	0.01574992	0.002885911
San Joaquin	2025	Annual	MH	DSL	Aggregated	70	711.4130897	0.0013	0.573980882	0.00073579	4.56404879	0.00585068	0.164225074	0.00021052	0.011999938	0.00001538	0.130339311	0.000167083	0.151087077	0.000193679	0.002999984	0.000003846	0.055859693	0.000071607
San Joaquin	2025	Annual	MH	GAS	Aggregated	70	3474.943454	0.0063	0.857894522	0.00537175	0.391660009	0.00245240	0.000260003	0.00000163	0.007999958	0.00005009	0.036749817	0.000230111	0.00024124	0.000001511	0.00199999	0.000012523	0.01574992	0.000098619
San Joaquin	2025	Annual	T6	DSL	Aggregated	70	6329.700489	0.0114	0.446117943	0.00508823	0.937964327	0.01069803	0.069406637	0.00079162	0.011999937	0.00013687	0.130339319	0.001486596	0.063854106	0.000728293	0.002999984	0.000034217	0.055859708	0.000637112
San Joaquin	2025	Annual	T6	GAS	Aggregated	70	956.161997	0.0017	1.139648304	0.00196353	0.446879273	0.00076994	0.000161138	0.00000028	0.007999959	0.00001378	0.036749816	0.000063317	0.000149509	0.000000258	0.00199999	0.000003446	0.01574992	0.000027136
San Joaquin	2025	Annual	T7	DSL	Aggregated	70	7849.928253	0.0141	1.18975331	0.01682894	1.896364336	0.02682389	0.131452928	0.00185939	0.035827214	0.00050677	0.061443671	0.000869115	0.120936694	0.001710638	0.008956803	0.000126693	0.026333002	0.000372478
San Joaquin	2025	Annual	T7	GAS	Aggregated	70	63.0284228	0.0001	52.0953982	0.00591657	7.381549039	0.00083834	0.000121923	0.00000001	0.007999959	0.00000091	0.036749815	0.000004174	0.000113124	0.000000013	0.00199999	0.000000227	0.01574992	0.000001789
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	70	142.5197392	0.0003	0.806950574	0.00020723	1.375476235	0.00035323	0.100320832	0.00002576	0.011999937	0.00000308	0.130339319	0.000033472	0.092295165	0.000023702	0.002999984	0.000000770	0.055859708	0.000014345
San Joaquin	2025	Annual	OBUS	GAS	Aggregated	70	247.5474439	0.0004	1.290467588	0.00057563	0.553991447	0.00024711	0.000140377	0.00000006	0.007999958	0.00000357	0.036749816	0.000016393	0.000130247	0.000000058	0.00199999	0.000000892	0.015749919	0.000007025
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	70	274.5299128	0.0005	0.447441682	0.00022134	6.821430723	0.00337442	0.065411327	0.00003236	0.011999937	0.00000594	0.744796108	0.000368435	0.060178421	0.000029769	0.002999984	0.000001484	0.319198332	0.000157901
San Joaquin	2025	Annual	SBUS	GAS	Aggregated	70	62.14188755	0.0001	5.44544941	0.00060975	1.583671315	0.00017733	0.001104354	0.00000012	0.007999958	0.00000090	0.036749815	0.000004115	0.001024659	0.000000115	0.00199999	0.000000224	0.01574992	0.000001764
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	70	195.9016057	0.0004	1.354656526	0.00047819	15.9890621	0.00564411	0.115378334	0.00004073	0.007999959	0.00000282	0.84181568	0.000297159	0.106148072	0.000037470	0.00199999	0.000000706	0.360778124	0.000127354
San Joaquin	2025	Annual	UBUS	GAS	Aggregated	70	39.4192171	0.0001	7.44233753	0.00052863	3.659318185	0.00025992	0.000638129	0.00000005	0.007999958	0.00000057	0.036749815	0.000002610	0.000592078	0.000000042	0.00199999	0.000000142	0.01574992	0.000001119
							554965.2	1.0		2.286		0.267		0.005		0.009		0.040		0.005		0.002		0.017

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	GAS	Aggregated	70	260852.5257	0.4961	0.018226826	0.0090
San Joaquin	2025	Annual	LDT1	GAS	Aggregated	70	38406.28141	0.0730	0.034627085	0.0025
San Joaquin	2025	Annual	LDT2	GAS	Aggregated	70	88492.32042	0.1683	0.023276484	0.0039
San Joaquin	2025	Annual	LHD1	GAS	Aggregated	70	14993.67828	0.0285	0.028027596	0.0008
San Joaquin	2025	Annual	LHD2	GAS	Aggregated	70	1043.347694	0.0020	0.011284616	0.0000
San Joaquin	2025	Annual	MCY	GAS	Aggregated	70	15453.01288	0.0294	5.801070595	0.1705
San Joaquin	2025	Annual	MDV	GAS	Aggregated	70	101688.1479	0.1934	0.041891013	0.0081
San Joaquin	2025	Annual	MH	GAS	Aggregated	70	3474.943454	0.0066	0.023290573	0.0002
San Joaquin	2025	Annual	T6	GAS	Aggregated	70	956.161997	0.0018	0.03340508	0.0001
San Joaquin	2025	Annual	T7	GAS	Aggregated	70	63.0284228	0.0001	0.480060889	0.0001
San Joaquin	2025	Annual	OBUS	GAS	Aggregated	70	247.5474439	0.0005	0.036605094	0.0000
San Joaquin	2025	Annual	SBUS	GAS	Aggregated	70	62.14188755	0.0001	0.219308766	0.0000
San Joaquin	2025	Annual	UBUS	GAS	Aggregated	70	39.4192171	0.0001	0.469295533	0.0000
							525772.6	1.0		0.195

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	70	837.1157869	0.0287	0.019662653	0.0006
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	70	49.85401761	0.0017	0.028907095	0.0000
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	70	45.8314763	0.0016	0.024694725	0.0000
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	70	10333.71435	0.3540	0.084085889	0.0298
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	70	2341.407554	0.0802	0.076756463	0.0062
San Joaquin	2025	Annual	MDV	DSL	Aggregated	70	80.772776	0.0028	0.020536033	0.0001
San Joaquin	2025	Annual	MH	DSL	Aggregated	70	711.4130897	0.0244	0.119895857	0.0029
San Joaquin	2025	Annual	T6	DSL	Aggregated	70	6329.700489	0.2168	0.06038428	0.0131
San Joaquin	2025	Annual	T7	DSL	Aggregated	70	7849.928253	0.2689	0.144133791	0.0388
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	70	142.5197392	0.0049	0.100546951	0.0005
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	70	274.5299128	0.0094	0.091438441	0.0009
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	70	195.9016057	0.0067	0.302051108	0.0020
							29192.7	1.0		0.095

EMFAC2011 Emission Rates
Region Type: County
Region: San Joaquin
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Joaquin	2025	Annual	LDA	DSL	Aggregated	70	837.1157869	0.0287	0.010756008	0.0003
San Joaquin	2025	Annual	LDT1	DSL	Aggregated	70	49.85401761	0.0017	0.016059272	0.0000
San Joaquin	2025	Annual	LDT2	DSL	Aggregated	70	45.8314763	0.0016	0.012313612	0.0000
San Joaquin	2025	Annual	LHD1	DSL	Aggregated	70	10333.71435	0.3540	0.017694378	0.0063
San Joaquin	2025	Annual	LHD2	DSL	Aggregated	70	2341.407554	0.0802	0.016430307	0.0013
San Joaquin	2025	Annual	MDV	DSL	Aggregated	70	80.772776	0.0028	0.011619637	0.0000
San Joaquin	2025	Annual	MH	DSL	Aggregated	70	711.4130897	0.0244	0.164225074	0.0040
San Joaquin	2025	Annual	T6	DSL	Aggregated	70	6329.700489	0.2168	0.069406637	0.0150
San Joaquin	2025	Annual	T7	DSL	Aggregated	70	7849.928253	0.2689	0.131452928	0.0353
San Joaquin	2025	Annual	OBUS	DSL	Aggregated	70	142.5197392	0.0049	0.100320832	0.0005
San Joaquin	2025	Annual	SBUS	DSL	Aggregated	70	274.5299128	0.0094	0.065411327	0.0006
San Joaquin	2025	Annual	UBUS	DSL	Aggregated	70	195.9016057	0.0067	0.115378334	0.0008
							29192.7	1.0		0.064

Emission Factor Rate Adjustment Worksheet

CO Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	1.217
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	2.895

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	2.311

Emfac (gr/mi)	3.467

NOX Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.204
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.485

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.425

Emfac (gr/mi)	0.638

Emission Factor Rate Adjustment Worksheet

PM10 Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.003
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.007

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.015

Emfac (gr/mi)	0.023

PM2.5 Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.003
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.007

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.014

Emfac (gr/mi)	0.021

Emission Factor Rate Adjustment Worksheet

<u>TOG GAS Emissions</u>

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.084
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.200

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.323

Emfac (gr/mi)	0.485

<u>TOG DSL Emissions</u>

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.112
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.266

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	1.248

Emfac (gr/mi)	1.872

Emission Factor Rate Adjustment Worksheet

<u>DSL Particulate Emissions</u>

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.037
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.088

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.071

Emfac (gr/mi)	0.107

Source: California Department of Transportation, 1989. Division of New Technology and Research. Caline4 – A Dispersion Model for Predicting Air Pollution Concentrations Near Roadways (Revised). FHWA/CA/TL-84/15.

Emission Factor Profile Worksheet
Chronic Exposure

TOG -Toxic Emissions

Gasoline/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.028414	0.021422	0.006603	0.005511	0.001533
2005	0.028205	0.021200	0.006551	0.005450	0.001520
2006	0.027938	0.021000	0.006483	0.005350	0.001510
2007	0.027660	0.020700	0.006410	0.005250	0.001490
2008	0.027338	0.020300	0.006326	0.005120	0.001470
2009	0.026849	0.019800	0.006190	0.004870	0.001450
2010	0.026521	0.019400	0.006105	0.004750	0.001430
2011	0.026521	0.019400	0.006105	0.004750	0.001430
2012	0.025656	0.018500	0.005873	0.004370	0.001380
2013	0.025656	0.018500	0.005873	0.004370	0.001380
2014	0.025656	0.018500	0.005873	0.004370	0.001380
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2016	0.024349	0.017100	0.005530	0.003850	0.001310
2017	0.024349	0.017100	0.005530	0.003850	0.001310
2018	0.022182	0.014700	0.004944	0.002860	0.001190
2019	0.022182	0.014700	0.004944	0.002860	0.001130
2020	0.021079	0.013600	0.004659	0.002450	0.001130
2021	0.021079	0.013600	0.004659	0.002450	0.001130
2022	0.021079	0.013600	0.004659	0.002450	0.001130
2023	0.021079	0.013600	0.004659	0.002450	0.001130
2024	0.021079	0.013600	0.004659	0.002450	0.001130
2025	0.021079	0.013600	0.004659	0.002450	0.001130
2026	0.021079	0.013600	0.004659	0.002450	0.001130
2027	0.021079	0.013600	0.004659	0.002450	0.001130
2028	0.021079	0.013600	0.004659	0.002450	0.001130
2029	0.021079	0.013600	0.004659	0.002450	0.001130
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Analysis Year					
2025	0.021079	0.013600	0.004659	0.002450	0.001130

TOG Emisson Rate - gr/mi

Speed (MPH)	Acceleration	0.200
	Deceleration	0.485
	70	0.195

Toxic Emission Rate - gr/mi	Acceleration	0.008584
Speed (MPH)	Deceleration	0.020815
	70	0.008369

Weight Fraction / Speciation

Benzene	0.491
Formaldehyde	0.317
1,3-Butadiene	0.109
Acetaldehyde	0.057
Acrolein	0.026

Diesel Particulate Emissions - PM10

PM10 Emission Rate - gr/mi	Acceleration	0.088
Speed (MPH)	Deceleration	0.107

Emission Factor Profile Worksheet
Chronic Exposure

70 0.064

Source: TOG/toxic fractions from UC Davis-Caltrans Air Quality Project, *Estimating Mobile Source Air Toxic Emissions: A Step-by-Step Project Analysis Methodology*. Task Order No. 61.

Emission Factor Profile Worksheet
Acute Exposure

TOG -Toxic Emissions

Gasoline/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.028414	0.021422	0.006603	0.005511	0.001533
2005	0.028205	0.021200	0.006551	0.005450	0.001520
2006	0.027938	0.021000	0.006483	0.005350	0.001510
2007	0.027660	0.020700	0.006410	0.005250	0.001490
2008	0.027338	0.020300	0.006326	0.005120	0.001470
2009	0.026849	0.019800	0.006190	0.004870	0.001450
2010	0.026521	0.019400	0.006105	0.004750	0.001430
2011	0.026521	0.019400	0.006105	0.004750	0.001430
2012	0.025656	0.018500	0.005873	0.004370	0.001380
2013	0.025656	0.018500	0.005873	0.004370	0.001380
2014	0.025656	0.018500	0.005873	0.004370	0.001380
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2016	0.024349	0.017100	0.005530	0.003850	0.001310
2017	0.024349	0.017100	0.005530	0.003850	0.001310
2018	0.022182	0.014700	0.004944	0.002860	0.001190
2019	0.022182	0.014700	0.004944	0.002860	0.001130
2020	0.021079	0.013600	0.004659	0.002450	0.001130
2021	0.021079	0.013600	0.004659	0.002450	0.001130
2022	0.021079	0.013600	0.004659	0.002450	0.001130
2023	0.021079	0.013600	0.004659	0.002450	0.001130
2024	0.021079	0.013600	0.004659	0.002450	0.001130
2025	0.021079	0.013600	0.004659	0.002450	0.001130
2026	0.021079	0.013600	0.004659	0.002450	0.001130
2027	0.021079	0.013600	0.004659	0.002450	0.001130
2028	0.021079	0.013600	0.004659	0.002450	0.001130
2029	0.021079	0.013600	0.004659	0.002450	0.001130
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Analysis Year					
2025	0.021079	0.013600	0.004659	0.002450	0.001130

TOG Emisson Rate - gr/mi		
Speed (MPH)	Acceleration	0.200
	Deceleration	0.485
	70	0.195

Toxic Emission Rate - gr/mi		
Speed (MPH)	Acceleration	0.008584
	Deceleration	0.020815
	70	0.008369

Weight Fraction / Speciation

Benzene	0.491
Formaldehyde	0.317
1,3-Butadiene	0.109
Acetaldehyde	0.057
Acrolein	0.026

TOG -Toxic Emissions

Diesel/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein

Emission Factor Profile Worksheet
Acute Exposure

2004	0.020009	0.147133	0.001900	0.073526	0
2005	0.020009	0.147133	0.001900	0.073526	0
2006	0.020009	0.147133	0.001900	0.073526	0
2007	0.020009	0.147133	0.001900	0.073526	0
2008	0.020009	0.147133	0.001900	0.073526	0
2009	0.020009	0.147133	0.001900	0.073526	0
2010	0.020009	0.147133	0.001900	0.073526	0
2011	0.020009	0.147133	0.001900	0.073526	0
2012	0.020009	0.147133	0.001900	0.073526	0
2013	0.020009	0.147133	0.001900	0.073526	0
2014	0.020009	0.147133	0.001900	0.073526	0
2015	0.020009	0.147133	0.001900	0.073526	0
2016	0.020009	0.147133	0.001900	0.073526	0
2017	0.020009	0.147133	0.001900	0.073526	0
2018	0.020009	0.147133	0.001900	0.073526	0
2019	0.020009	0.147133	0.001900	0.073526	0
2020	0.020009	0.147133	0.001900	0.073526	0
2021	0.020009	0.147133	0.001900	0.073526	0
2022	0.020009	0.147133	0.001900	0.073526	0
2023	0.020009	0.147133	0.001900	0.073526	0
2024	0.020009	0.147133	0.001900	0.073526	0
2025	0.020009	0.147133	0.001900	0.073526	0
2026	0.020009	0.147133	0.001900	0.073526	0
2027	0.020009	0.147133	0.001900	0.073526	0
2028	0.020009	0.147133	0.001900	0.073526	0
2029	0.020009	0.147133	0.001900	0.073526	0
2030	0.020009	0.147133	0.001900	0.073526	0

Analysis Year

2025	0.020009	0.147133	0.001900	0.073526	0

TOG Emisson Rate - gr/mi		
Speed (MPH)	Acceleration	0.266
	Deceleration	1.872
	70	0.095

Toxic Emission Rate - gr/mi	Acceleration	0.064523
Speed (MPH)	Deceleration	0.454087
	70	0.023044

Weight Fraction / Speciation

Benzene	0.082
Formaldehyde	0.607
1,3-Butadiene	0.008
Acetaldehyde	0.303
Acrolein	0.000

On-Road Mobile Sources
Emission Rate Computation

WB Route 580 (Sources __ to __)

CO Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Pollutant Mass Emission Rate (gr/mi)	2.286

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

Pollutant Emission Rate (gr/sec)	2.03474
Pollutant Emission Rate (gr/sec/source)	4.21E-03

EB Route 580 (Sources __ to __)

CO Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Pollutant Mass Emission Rate (gr/mi)	2.286

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

Pollutant Emission Rate (gr/sec)	2.03474
Pollutant Emission Rate (gr/sec/source)	4.21E-03

WB ON @ Corral Hollow Road (Sources __ to __)

CO Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	72.9
Pollutant Mass Emission Rate (gr/mi)	2.895

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

Pollutant Emission Rate (gr/sec)	0.00873
Pollutant Emission Rate (gr/sec/source)	2.18E-04

WB OFF @ Corral Hollow Road (Sources __ to __)

CO Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	89.6
Pollutant Mass Emission Rate (gr/mi)	3.467

On-Road Mobile Sources
Emission Rate Computation

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

Pollutant Emission Rate (gr/sec)	0.01409
Pollutant Emission Rate (gr/sec/source)	3.20E-04

EB ON @ Corral Hollow Road (Sources __ to __)

CO Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	85.4
Pollutant Mass Emission Rate (gr/mi)	2.895

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

Pollutant Emission Rate (gr/sec)	0.01217
Pollutant Emission Rate (gr/sec/source)	2.53E-04

EB OFF @ Corral Hollow Road (Sources __ to __)

CO Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	62.1
Pollutant Mass Emission Rate (gr/mi)	3.467

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

Pollutant Emission Rate (gr/sec)	0.00748
Pollutant Emission Rate (gr/sec/source)	2.20E-04

On-Road Mobile Sources
Emission Rate Computation

WB Route 580 (Sources __ to __)

NOx Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Pollutant Mass Emission Rate (gr/mi)	0.267

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

Pollutant Emission Rate (gr/sec)	0.23765
Pollutant Emission Rate (gr/sec/source)	4.92E-04

EB Route 580 (Sources __ to __)

NOx Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Pollutant Mass Emission Rate (gr/mi)	0.267

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

Pollutant Emission Rate (gr/sec)	0.23765
Pollutant Emission Rate (gr/sec/source)	4.92E-04

WB ON @ Corral Hollow Road (Sources __ to __)

NOx Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	72.9
Pollutant Mass Emission Rate (gr/mi)	0.485

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

Pollutant Emission Rate (gr/sec)	0.00146
Pollutant Emission Rate (gr/sec/source)	3.66E-05

WB OFF @ Corral Hollow Road (Sources __ to __)

NOx Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	89.6
Pollutant Mass Emission Rate (gr/mi)	0.638

On-Road Mobile Sources
Emission Rate Computation

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

Pollutant Emission Rate (gr/sec)	0.00259
Pollutant Emission Rate (gr/sec/source)	5.89E-05

EB ON @ Corral Hollow Road (Sources __ to __)

NOx Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	85.4
Pollutant Mass Emission Rate (gr/mi)	0.485

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

Pollutant Emission Rate (gr/sec)	0.00204
Pollutant Emission Rate (gr/sec/source)	4.25E-05

EB OFF @ Corral Hollow Road (Sources __ to __)

NOx Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	62.1
Pollutant Mass Emission Rate (gr/mi)	0.638

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

Pollutant Emission Rate (gr/sec)	0.00138
Pollutant Emission Rate (gr/sec/source)	4.05E-05

WB Route 580 (Sources __ to __)

PM10 Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.122

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading) $^{0.91}$ *x (Gross Vehicle Weight)* $^{1.02}$ *) + (Emfac2011 Emissions)*
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.109002
PM10 Reentrainment Emission Rate (gr/sec/source)	2.26E-04

EB Route 580 (Sources __ to __)

PM10 Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.122

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading) $^{0.91}$ *x (Gross Vehicle Weight)* $^{1.02}$ *) + (Emfac2011 Emissions)*
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.109002
PM10 Reentrainment Emission Rate (gr/sec/source)	2.26E-04

WB ON @ Corral Hollow Road (Sources __ to __)

PM10 Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	72.9
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4

On-Road Mobile Sources
Emission Rate Computation

Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.124

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.000375
PM10 Reentrainment Emission Rate (gr/sec/source)	9.38E-06

WB OFF @ Corral Hollow Road (Sources __ to __)

PM10 Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	89.6
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.023
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.140

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.000571
PM10 Reentrainment Emission Rate (gr/sec/source)	1.30E-05

EB ON @ Corral Hollow Road (Sources __ to __)

PM10 Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	85.4
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.124

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.000523
PM10 Reentrainment Emission Rate (gr/sec/source)	1.09E-05

On-Road Mobile Sources
Emission Rate Computation

EB OFF @ Corral Hollow Road (Sources __ to __)

PM10 Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	62.1
Particle Size Multiplier (g/mi)	1.00
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.023
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.140

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.000303
PM10 Reentrainment Emission Rate (gr/sec/source)	8.91E-06

2.26E-04

2.26E-04

9.38E-06

1.30E-05

1.09E-05

8.91E-06

On-Road Mobile Sources
Emission Rate Computation

WB Route 580 (Sources __ to __)

PM2.5 Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.041

For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading) $^{0.91}$ *x (Gross Vehicle Weight)* $^{1.02}$ *) + (Emfac2011 Emissions)*
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM2.5 Reentrainment Emission Rate (gr/sec)	0.036819
PM2.5 Reentrainment Emission Rate (gr/sec/source)	7.62E-05

EB Route 580 (Sources __ to __)

PM2.5 Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1458.3
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.041

For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading) $^{0.91}$ *x (Gross Vehicle Weight)* $^{1.02}$ *) + (Emfac2011 Emissions)*
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM2.5 Reentrainment Emission Rate (gr/sec)	0.036819
PM2.5 Reentrainment Emission Rate (gr/sec/source)	7.62E-05

WB ON @ Corral Hollow Road (Sources __ to __)

PM2.5 Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	72.9
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4

On-Road Mobile Sources
Emission Rate Computation

Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.019
	0.043

For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000131
PM2.5 Reentrainment Emission Rate (gr/sec/source)	3.27E-06

WB OFF @ Corral Hollow Road (Sources __ to __)

PM2.5 Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	89.6
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.021
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.057

For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000233
PM2.5 Reentrainment Emission Rate (gr/sec/source)	5.30E-06

EB ON @ Corral Hollow Road (Sources __ to __)

PM2.5 Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	85.4
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.043

For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000182
PM2.5 Reentrainment Emission Rate (gr/sec/source)	3.80E-06

On-Road Mobile Sources
Emission Rate Computation

EB OFF @ Corral Hollow Road (Sources __ to __)

PM2.5 Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	62.1
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.4
Emfac2011 Emissions Run (g/mi)	0.021
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.057

For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM2.5 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000124
PM2.5 Reentrainment Emission Rate (gr/sec/source)	3.64E-06

7.62E-05

7.62E-05

3.27E-06

5.30E-06

3.80E-06

3.64E-06

On-Road Mobile Sources
Emission Rate Computation

WB Route 580 (Sources __ to __)

TOG GAS Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1381.6
Pollutant Mass Emission Rate (gr/mi)	0.008369

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

Pollutant Emission Rate (gr/sec)	0.00706
Pollutant Emission Rate (gr/sec/source)	1.46E-05

EB Route 580 (Sources __ to __)

TOG GAS Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	1381.6
Pollutant Mass Emission Rate (gr/mi)	0.008369

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

Pollutant Emission Rate (gr/sec)	0.00706
Pollutant Emission Rate (gr/sec/source)	1.46E-05

WB ON @ Corral Hollow Road (Sources __ to __)

TOG GAS Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	69.2
Pollutant Mass Emission Rate (gr/mi)	0.008584

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

Pollutant Emission Rate (gr/sec)	0.00002
Pollutant Emission Rate (gr/sec/source)	6.14E-07

WB OFF @ Corral Hollow Road (Sources __ to __)

TOG GAS Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	85.0
Pollutant Mass Emission Rate (gr/mi)	0.020815

On-Road Mobile Sources
Emission Rate Computation

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

Pollutant Emission Rate (gr/sec)	0.00008
Pollutant Emission Rate (gr/sec/source)	1.82E-06

EB ON @ Corral Hollow Road (Sources __ to __)

TOG GAS Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	81.0
Pollutant Mass Emission Rate (gr/mi)	0.008584

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

Pollutant Emission Rate (gr/sec)	0.00003
Pollutant Emission Rate (gr/sec/source)	7.13E-07

EB OFF @ Corral Hollow Road (Sources __ to __)

TOG GAS Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	58.9
Pollutant Mass Emission Rate (gr/mi)	0.020815

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

Pollutant Emission Rate (gr/sec)	0.00004
Pollutant Emission Rate (gr/sec/source)	1.25E-06

h)

1.46E-05

h)

1.46E-05

h)

6.14E-07

On-Road Mobile Sources
Emission Rate Computation

h)

1.82E-06

h)

7.13E-07

h)

1.25E-06

On-Road Mobile Sources
Emission Rate Computation

WB Route 580 (Sources __ to __)

TOG DSL Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	76.7
Pollutant Mass Emission Rate (gr/mi)	0.023044

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

Pollutant Emission Rate (gr/sec)	0.00108
Pollutant Emission Rate (gr/sec/source)	2.23E-06

EB Route 580 (Sources __ to __)

TOG DSL Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	76.7
Pollutant Mass Emission Rate (gr/mi)	0.023044

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

Pollutant Emission Rate (gr/sec)	0.00108
Pollutant Emission Rate (gr/sec/source)	2.23E-06

WB ON @ Corral Hollow Road (Sources __ to __)

TOG DSL Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	3.8
Pollutant Mass Emission Rate (gr/mi)	0.064523

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

Pollutant Emission Rate (gr/sec)	0.00001
Pollutant Emission Rate (gr/sec/source)	2.54E-07

WB OFF @ Corral Hollow Road (Sources __ to __)

TOG DSL Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	4.6
Pollutant Mass Emission Rate (gr/mi)	0.454087

On-Road Mobile Sources
Emission Rate Computation

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

Pollutant Emission Rate (gr/sec)	0.00009
Pollutant Emission Rate (gr/sec/source)	2.15E-06

EB ON @ Corral Hollow Road (Sources __ to __)

TOG DSL Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	4.4
Pollutant Mass Emission Rate (gr/mi)	0.064523

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

Pollutant Emission Rate (gr/sec)	0.00001
Pollutant Emission Rate (gr/sec/source)	2.91E-07

EB OFF @ Corral Hollow Road (Sources __ to __)

TOG DSL Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	3.2
Pollutant Mass Emission Rate (gr/mi)	0.454087

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

Pollutant Emission Rate (gr/sec)	0.00005
Pollutant Emission Rate (gr/sec/source)	1.48E-06

On-Road Mobile Sources
Emission Rate Computation

ı)

2.23E-06

ı)

2.23E-06

ı)

2.54E-07

On-Road Mobile Sources
Emission Rate Computation

h)

2.15E-06

h)

2.91E-07

h)

1.48E-06

On-Road Mobile Sources
Emission Rate Computation

WB Route 580 (Sources __ to __)

DSL Particulate Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	76.7
Pollutant Mass Emission Rate (gr/mi)	0.064

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

Pollutant Emission Rate (gr/sec)	0.00300
Pollutant Emission Rate (gr/sec/source)	6.20E-06

EB Route 580 (Sources __ to __)

DSL Particulate Emissions

Number of Sources	483
Link Length (meters)	3536.1
Volume/Baseline (VPH)	76.7
Pollutant Mass Emission Rate (gr/mi)	0.064

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

Pollutant Emission Rate (gr/sec)	0.00300
Pollutant Emission Rate (gr/sec/source)	6.20E-06

WB ON @ Corral Hollow Road (Sources __ to __)

DSL Particulate Emissions

Number of Sources	40
Link Length (meters)	239.6
Volume/Baseline (VPH)	3.8
Pollutant Mass Emission Rate (gr/mi)	0.088

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

Pollutant Emission Rate (gr/sec)	0.00001
Pollutant Emission Rate (gr/sec/source)	3.46E-07

WB OFF @ Corral Hollow Road (Sources __ to __)

DSL Particulate Emissions

Number of Sources	44
Link Length (meters)	262.7
Volume/Baseline (VPH)	4.6
Pollutant Mass Emission Rate (gr/mi)	0.107

On-Road Mobile Sources
Emission Rate Computation

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

Pollutant Emission Rate (gr/sec)	0.00002
Pollutant Emission Rate (gr/sec/source)	5.07E-07

EB ON @ Corral Hollow Road (Sources __ to __)

DSL Particulate Emissions

Number of Sources	48
Link Length (meters)	285.1
Volume/Baseline (VPH)	4.4
Pollutant Mass Emission Rate (gr/mi)	0.088

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

Pollutant Emission Rate (gr/sec)	0.00002
Pollutant Emission Rate (gr/sec/source)	3.97E-07

EB OFF @ Corral Hollow Road (Sources __ to __)

DSL Particulate Emissions

Number of Sources	34
Link Length (meters)	201.2
Volume/Baseline (VPH)	3.2
Pollutant Mass Emission Rate (gr/mi)	0.107

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

Pollutant Emission Rate (gr/sec)	0.00001
Pollutant Emission Rate (gr/sec/source)	3.50E-07

On-Road Mobile Sources
Emission Rate Computation

h)

6.20E-06

h)

6.20E-06

h)

3.46E-07

On-Road Mobile Sources
Emission Rate Computation

h)

5.07E-07

h)

3.97E-07

h)

3.50E-07

San Joaquin County Vehicle Population

All	554965.2
DSL	29192.7

Chronic Diesel Fleet Mix (weight fraction) 0.0526

Link Counts	Sources	AADT	VPH all	VPH gas	VPH diesel
WB Route 580		35000	1458.3	1381.6	76.7
EB Route 580		35000	1458.3	1381.6	76.7
WB ON		1750	72.9	69.1	3.8
WB OFF		2150	89.6	84.9	4.7
EB ON		2050	85.4	80.9	4.5
EB OFF		1490	62.1	58.8	3.3

APPENDIX 4.1:

AERMOD DISPERSION MODEL SUMMARY FILE

APPENDIX 4.2:

AERMOD DISPERSION MODEL INPUT/OUTPUT FILES

(electronic format, available upon request)

APPENDIX 5.1:

RISK CALCULATION WORKSHEETS

Table A1
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
Residential Exposure Scenario (70 Year) Without MERV 13 (or equivalent) Filtration

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3)	(mg/m3)			URF (ug/m3)	CPF (mg/kg/day)	RISK	REL (ug/m3)	RfD (mg/kg/day)	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)	(o)	(p)	(q)	(r)
Freeway	0.11143	1.1E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	1.4E-06	6.0E+01	1.7E-02		8.2E-04	8.2E-04				8.2E-04	
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	2.1E-07	9.0E+00	2.6E-03	3.9E-03							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	1.9E-06	2.0E+01	5.7E-03							5.6E-04	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	2.4E-08	1.4E+02	4.0E-02	6.0E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	7.6E-03							
	0.04732	4.7E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	1.4E-05	5.0E+00	1.4E-03	9.1E-03							
Total							1.72E-05			2.1E-02	8.2E-04	8.2E-04	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	70
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	25550

Table A2
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
Residential Exposure Scenario (70 Year) With MERV 13 (or equivalent) Filtration

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
					URF	CPF	RISK	REL	RfD	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
	(ug/m3)	(mg/m3)			(ug/m3)	(mg/kg/day)		(ug/m3)	(mg/kg/day)								
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
Freeway	0.11143	1.1E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	1.4E-06	6.0E+01	1.7E-02		8.2E-04	8.2E-04				8.2E-04	
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	2.1E-07	9.0E+00	2.6E-03	3.9E-03							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	1.9E-06	2.0E+01	5.7E-03							5.6E-04	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	2.4E-08	1.4E+02	4.0E-02	6.0E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	7.6E-03							
	0.01183	1.2E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	3.4E-06	5.0E+00	1.4E-03	2.3E-03							
Total							6.97E-06			1.4E-02	8.2E-04	8.2E-04	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	70
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	25550

Table A3
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
Residential Exposure Scenario (30 Year) Without MERV 13 (or equivalent) Filtration

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3)	(mg/m3)			URF (ug/m3)	CPF (mg/kg/day)	RISK	REL (ug/m3)	RfD (mg/kg/day)	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)	(o)	(p)	(q)	(r)
Freeway	0.11143	1.1E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	6.1E-07	6.0E+01	1.7E-02		8.2E-04	8.2E-04				8.2E-04	
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	9.1E-08	9.0E+00	2.6E-03	3.9E-03							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	8.2E-07	2.0E+01	5.7E-03							5.6E-04	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	1.0E-08	1.4E+02	4.0E-02	6.0E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	7.6E-03							
	0.04732	4.7E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	5.8E-06	5.0E+00	1.4E-03	9.1E-03							
Total							7.36E-06			2.1E-02	8.2E-04	8.2E-04	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	30
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	10950

Table A4
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
Residential Exposure Scenario (30 Year) With MERV 13 (or equivalent) Filtration

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3)	(mg/m3)			URF (ug/m3)	CPF (mg/kg/day)	RISK	REL (ug/m3)	RfD (mg/kg/day)	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)	(o)	(p)	(q)	(r)
Freeway	0.11143	1.1E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	6.1E-07	6.0E+01	1.7E-02		8.2E-04	8.2E-04				8.2E-04	
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	9.1E-08	9.0E+00	2.6E-03	3.9E-03							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	8.2E-07	2.0E+01	5.7E-03							5.6E-04	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	1.0E-08	1.4E+02	4.0E-02	6.0E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	7.6E-03							
	0.01183	1.2E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	1.5E-06	5.0E+00	1.4E-03	2.3E-03							
Total							2.99E-06			1.4E-02	8.2E-04	8.2E-04	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	30
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	10950

Table A5
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
Residential Exposure Scenario (9 Year) Without MERV 13 (or equivalent) Filtration

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3)	(mg/m3)			URF (ug/m3)	CPF (mg/kg/day)	RISK	REL (ug/m3)	RfD (mg/kg/day)	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)	(o)	(p)	(q)	(r)
Freeway	0.11143	1.1E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	1.8E-07	6.0E+01	1.7E-02		8.2E-04	8.2E-04				8.2E-04	
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	2.7E-08	9.0E+00	2.6E-03	3.9E-03							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	2.5E-07	2.0E+01	5.7E-03							5.6E-04	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	3.1E-09	1.4E+02	4.0E-02	6.0E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	7.6E-03							
	0.04732	4.7E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	1.8E-06	5.0E+00	1.4E-03	9.1E-03							
Total							2.21E-06			2.1E-02	8.2E-04	8.2E-04	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	9
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	3285

Table A6
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
Residential Exposure Scenario (9 Year) With MERV 13 (or equivalent) Filtration

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3)	(mg/m3)			URF (ug/m3)	CPF (mg/kg/day)	RISK	REL (ug/m3)	RfD (mg/kg/day)	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)	(o)	(p)	(q)	(r)
Freeway	0.11143	1.1E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	1.8E-07	6.0E+01	1.7E-02		8.2E-04	8.2E-04				8.2E-04	
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	2.7E-08	9.0E+00	2.6E-03	3.9E-03							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	2.5E-07	2.0E+01	5.7E-03							5.6E-04	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	3.1E-09	1.4E+02	4.0E-02	6.0E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	7.6E-03							
	0.01183	1.2E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	4.4E-07	5.0E+00	1.4E-03	2.3E-03							
Total							8.96E-07			1.4E-02	8.2E-04	8.2E-04	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	9
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	3285

Table A7
Quantification of Noncarcinogenic Acute Hazards
1-Hour Exposure / Average Traffic Scenario

Source	Concentration (ug/m3)	Weight Fraction	Contaminant	Noncarcinogenic Hazards / Toxicological Endpoints*								
				REL (ug/m3)	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
Freeway TOG	0.89462	4.60E-01	Benzene	1.3E+03			3.2E-04	3.2E-04			3.2E-04	
		3.32E-01	Formaldehyde	5.5E+01								5.4E-03
		7.80E-02	Acetaldehyde	4.7E+02	1.5E-04							1.5E-04
		2.50E-02	Acrolein	2.5E+00	8.9E-03							8.9E-03
Freeway Diesel/TOG	0.13685	8.20E-02	Benzene	1.3E+03			8.6E-06	8.6E-06			8.6E-06	
		6.07E-01	Formaldehyde	5.5E+01								1.5E-03
		3.03E-01	Acetaldehyde	4.7E+02	8.8E-05							8.8E-05
Total					9.2E-03	0.0E+00	3.3E-04	3.3E-04	0.0E+00	0.0E+00	3.3E-04	1.6E-02

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Table A8
Quantification of Noncarcinogenic Acute Hazards
8-Hour Exposure / Average Traffic Scenario

Source	Concentration (ug/m3)	Weight Fraction	Contaminant	Noncarcinogenic Hazards / Toxicological Endpoints*								
				REL (ug/m3)	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
Freeway TOG	0.57234	3.32E-01	Formaldehyde	9.0E+00	2.1E-02							
		7.80E-02	Acetaldehyde	3.0E+02	1.5E-04							
		2.50E-02	Acrolein	7.0E-01	2.0E-02							
Freeway Diesel/TOG	0.08755	6.07E-01	Formaldehyde	9.0E+00	5.9E-03							
		3.03E-01	Acetaldehyde	3.0E+02	8.8E-05							
Total					4.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects