Figure 1 - Site Location

Project Boundary

Temecula Sphere of Influence Boundary

0 600

Scale (Feet)

Base Map Source: Google Earth Pro, 2016

2. Project Description

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3. Source Identification

The health risk assessment evaluated the impact of potential long-term (chronic) exposure to air toxic emissions generated by vehicles traveling along SR-79 (mile post 7.63). Due to the proximity of the project site to SR-79, potential long-term (chronic) exposure to air toxic emissions and short-term (acute) health impacts from exposures to criteria pollutants (particulate matter, carbon monoxide, and nitrogen dioxide) were evaluated.

Properties within a quarter-mile radius (1,320 feet) were surveyed using aerial photography and SCAQMD's Facility Information Detail (FIND) database to identify facilities that have the potential to generate hazardous and acutely hazardous air emissions. Due to the rural nature of the surrounding area, no additional permitted or non-permitted facilities were identified. Additionally, the Riverside County Agricultural Commissioner's Office (County) implements a general permit condition to growers in the County specifically preventing the ground application of pesticides or herbicides within a ¼-mile of a school during school hours. In addition to preventing pesticide application during school hours, the County prohibits pesticide spraying during non-school hours for major school events. Since active growers in the County would be prevented from spraying pesticides during school hours within a ¼-mile radius of the site, there should be no adverse health impacts on students and staff at the proposed elementary school from pesticide or herbicide spraying.

A summary of the emissions sources evaluated during this assessment is provided below in Table 1.

Table 1 Emission Sources

Source	Location
State Route 79	Mile Post 7.63

3. Source Identification

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4. Source Characterization

Vehicle emissions contribute significantly to localized concentrations of air contaminants. Typically, emissions generated from these sources depend on vehicle mix, the percentage of heavy duty diesel trucks, the rate at which pollutants are generated during the course of travel, and the number of vehicles traveling along the roadway network.

The peak hourly traffic for the section of SR-79 nearest the project site was determined from the *Traffic Impact Analysis for Temecula Valley Charter School* (PlaceWorks, 2016). Additionally, projected future peak hourly traffic was determined from the *2014 Final State Route 79 Realignment Supplemental Traffic Report* (Riverside County Transportation Commission), assuming realignment project approval. To produce a representative vehicle fleet distribution of gasoline fueled and diesel fueled vehicles, the assessment utilized an estimate of vehicle mix based on annual truck traffic reports from the California Department of Transportation, Traffic Branch (Caltrans). Table 2 lists the identified peak hourly traffic volumes and diesel truck percentage considered in the assessment.

Table 2 Vehicle Fleet Mix Profile

Roadway	Peak Hourly Vehicle Traffic (Veh/hr)[1]	Truck Percentage[2]
SR-79 (Mile Post 7.63)	2016 – 1,964	10
	2040 - 7,212	10

Sources:
1 2016 peak hour traffic from *Traffic Impact Analysis for Temecula Valley Charter School* (PlaceWorks, 2016); projected 2040 peak hourly traffic from *2014 Final State Route 79 Realignment Supplemental Traffic Report* (Riverside County Transportation Commission), assuming realignment project approval.
2 Caltrans Traffic Census Website. http://traffic-counts.dot.ca.gov/.

The truck percentage for each evaluated roadway segment was used to estimate the number of diesel trucks traveling on each roadway. To determine variances in hourly traffic volumes, the assessment used data available through the Caltrans Performance Measurement System (Caltrans PeMS, 2016). An average annual traffic increase was determined using the 2016 and 2040 peak hour traffic volumes. To account for the emission standards representative of the California fleet, the Air Resources Board has developed the EMFAC2014 emission factor model. EMFAC2014 was used to identify pollutant emission rates for total organic gases (TOG), diesel particulate matter (DPM), carbon monoxide (CO) and nitrogen dioxide (NO_2). The PM_{10} emission factor was used as the surrogate for DPM. To quantify the toxic air contaminants (TACs) associated with the TOG fraction, the speciation profile provided by the Bay Area Air Quality Management District (2012) was used.

For particulate matter (PM_{10} and $PM_{2.5}$), emissions were quantified as the sum of re-entrainment of paved roadway dust and tailpipe emissions. The predictive emission equation developed by the USEPA (AP-42, Section 13.2.1) was used to generate the entrained dust source strength.

4. Source Characterization

A list of emitted compounds for the mobile-source category is presented in Table 3. Appendix A presents the emission rate calculations for each source considered in the assessment. Appendix B contains a graphical representation of each emitting source.

Table 3 Compounds Emitted from Mobile Sources

Source	Contaminant
SR-79 (gasoline vehicles and diesel trucks)	Diesel Particulate Matter (DPM) Acetaldehyde, Acrolein, Benzene, 1,3-Butadiene, Ethylbenzene, Formaldehyde, Hexane, Methanol, Methyl Ethyl Ketone, Naphthalene, Propylene, Styrene, Toluene, Xylenes Particulate Matter (PM_{10} and $PM_{2.5}$) Carbon Monoxide Nitrogen Dioxide

Note: EMFAC2014 generates emission factors for nitrogen oxides (NOx). To convert to nitrogen dioxide, an NO_2 to NOx ratio of 0.053 was applied. The NO_2 conversion rate was derived from a report entitled Final Localized Significance Threshold Methodology (SCAQMD, 2008).

5. Air Dispersion Modeling

To assess the impact of emitted compounds on individuals who may work and/or attend classes at the proposed school facility, air quality modeling using the AERMOD atmospheric dispersion model was performed. The model is a steady state Gaussian plume model and is recommended by SCAQMD for estimating ground level impacts from point and fugitive sources in simple and complex terrain.

The model requires additional input parameters, including chemical emission data and local meteorology. Inputs for each emitting source were based on the characterizations referenced in Section 4. Meteorological data provided by SCAQMD for the Lake Elsinore meteorological station (2008-2012) were used to represent local weather conditions and prevailing winds. According to the wind rose for the Lake Elsinore, presented in Appendix A, the prevailing wind direction in the area of the project site is to the southwest.

The modeling analysis also considered the spatial distribution of each emitting source in relation to the project site. To accommodate the model's Cartesian grid format, direction-dependent calculations were obtained by identifying the Universal Transverse Mercator coordinates for each source. In addition, digital elevation model (DEM) data for the area were obtained and included in the model runs to account for complex terrain. For all modeling runs, a unit emission rate of 1 gram per second (g/s) was used. The unit emission rates were proportioned among the volume sources for mobile sources (e.g. SR-79). The maximum AERMOD concentrations from the output files were then multiplied by the emission rates calculated in Appendix A to obtain the maximum ground-level concentrations at the school site.

For mobile sources, two sets of volume sources were modeled in AERMOD. One set of volume sources representing the motor vehicles traveling along the mobile sources was used to characterize emissions of TOG, CO, NO_x, $PM_{10,}$ and $PM_{2.5}$. For this run, a release height of 0.60 meters was used (CARB, 2000). The second set of volume sources representing truck traffic was used to characterize emissions of DPM. For this set of sources, a release height of 4.15 m was used. Different emission factors were used to characterize TOG and DPM emissions from vehicle traffic traveling along SR-79 due to different exposure periods for adult staff and students. For the adult staff exposure scenario, a 25-year exposure period was used, as per the new OEHHA guidance for worker exposure. A 9-year exposure period was used for the student exposure scenario representing the school years for kindergarten through 8th grade.

The AERMOD output for the emission sources is presented in Appendix C. The ground-level concentrations used in the risk calculation spreadsheets are provided in Table D1 of Appendix D. The annual average concentrations from the AERMOD runs were used to determine cancer risk and chronic non-cancer risk, and the maximum one-hour concentrations were used to determine acute non-cancer risk. Additionally, CARB's Hotspots Analysis and Reporting Program (HARP2), Risk Assessment Standalone Tool was used to determine the 8-hour chronic non-cancer risk; the program determines the 8-hour non-cancer risk from the annual average concentrations (CARB, 2016).

5. Air Dispersion Modeling

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6. Risk Characterizations

6.1 CARCINOGENIC CHEMICAL RISK

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. The SCAQMD has established a maximum incremental cancer risk of 10 in a million ($1x10^{-5}$) for CEQA projects and the OEHHA also sets a typical risk management level as 10 in a million (OEHHA, 2015).

Health risks associated with exposure to carcinogenic compounds at the proposed project site 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 cancer potency factor (CPF), a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It is an upper-limit estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ($\mu g/m^3$) over a lifetime of 70 years.

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

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

Where:

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

The inhalation absorption factor (A) is a unitless factor that is only used if the cancer potency factor included a correction for absorption across the lung. For this assessment, the default value of 1 was used. To represent the unique characteristics of the school population, the assessment employed the USEPA's guidance to develop viable dose estimates based on reasonable maximum exposure, defined as the "highest exposure that

is reasonably expected to occur" for a given receptor population. Lifetime risk values for the student population were adjusted to account for an exposure of 180 days per year for 9 years (kindergarten through 8th grade). In addition, the calculated risk for students is multiplied by an ASF weighting factor of 3 (for children ages 2 to 16) to account for early life sensitivity to pollutant exposures (OEHHA, 2015). To assess staff-related risk, exposures were adjusted to account for an employment period of 250 days per year for 25 years. This timeline is considered appropriate for potential workplace exposures established by OEHHA (2015).

To calculate the overall cancer risk, the risk for each appropriate age group is calculated per the following equation:

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

Where:

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

The CPFs used in the assessment were obtained from OEHHA guidance. The cancer risk is calculated separately for the students and staff, because of age differences in sensitivity to carcinogens and age differences in intake rates. The final step converts the cancer risk in scientific notation to a whole number that expresses the cancer risk in "chances per million" by multiplying the cancer risk by a factor of $1x10^6$ (i.e. 1 million).

CARB's Hotspots Analysis and Reporting Program (HARP2), Risk Assessment Standalone Tool was used to calculate the cancer risk values (CARB, 2016). The determined cancer risks attributed to each chemical exposure and summation of those risks are presented in Appendix D, Table D2.

6.2 NON-CARCINOGENIC HAZARDS

An evaluation of the potential non-cancer effects of chronic and acute chemical exposures was also conducted. Under the point estimate approach, adverse health effects are evaluated by comparing the annual ground level concentration of each chemical compound with the appropriate Reference Exposure Level (REL). Available RELs promulgated by OEHHA were considered in the assessment.

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

CARB's HARP2, Risk Assessment Standalone Tool was used to calculate the chronic and acute health risk values (CARB, 2016). The determined non-cancer hazard quotient for identified compounds generated from each source and a summation for each toxicological endpoint are presented in Appendix D, Tables D2-D4.

6.3 CRITERIA AIR POLLUTANTS

The State of California has promulgated 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 that may be affected by increased pollutant concentrations. A list of criteria air pollutants considered in the assessment and their associated air quality standards are presented in Table 4.

Table 4 California Ambient Air Quality Standards

Pollutant	Standard	Health Effects
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)	≥0.030 ppm (annual avg.) ≥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.
Particulates (PM_{10})	>50 μg/m^3 (24 hr avg.) >20 μg/m^3 (annual avg.)	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/m^3 (annual avg.)	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.

Notes: 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 significant pollutant concentrations. Should ambient air quality already exceed existing standards, SCAQMD has established significance criteria that identify incremental air concentrations for selected pollutants. Table 5 outlines the significance thresholds considered for sites that are within an air basin where criteria pollutants exceed air quality standards.

6. Risk Characterizations

Table 5 Localized Significance Thresholds

Pollutant	Averaging Time	Significance Criteria
Carbon Monoxide (CO)	8 Hours 1 Hour	Project contributes to exceedance of 9.0 ppm Project contributes to exceedance of 20 ppm
Nitrogen Dioxide (NO_2)	Annual 1 Hour	Project contributes to exceedance of 0.03 ppm Project contributes to exceedance of 0.18 ppm
Particulates (PM_{10})	Annual 24 Hours	Project causes an incremental increase of 1.0 $\mu g/m^3$ Project causes an incremental increase of 2.5 $\mu g/m^3$
Particulates ($PM_{2.5}$)	24 Hours	Project causes an incremental increase of 2.5 $\mu g/m^3$

Notes: ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
Source: SCAQMD, 2015. SCAQMD Air Quality Significance Thresholds accessed online at http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook.

The nearest active air quality monitoring station to the project site is the Lake Elsinore Monitoring Station. Background concentrations are based on the highest observed value for the most recent three-year period. PM_{10} and $PM_{2.5}$ data were not collected for the Lake Elsinore Monitoring Station. Therefore, PM_{10} and $PM_{2.5}$ data from the nearest monitoring station with available data (Perris Valley Monitoring Station and Metropolitan Riverside County 1, respectively) were used for particulate analysis. A summary of the monitoring station data is presented in Table 6.

Table 6 Lake Elsinore Monitoring Station Summary

	Year				
Pollutant/Averaging Time	2014	2013	2012	Maximum	CAAQS
Carbon Monoxide (CO)					
1-Hour	2.0	NM	NM	2.0	20
8-Hour	1.4	0.6	0.7	1.4	9
Nitrogen Dioxide (NO_2)					
1-Hour	0.0453	0.0466	0.0483	0.0483	0.18
Annual	0.0082	0.0084	0.0102	0.0102	0.030
Particulates (PM_{10})					
24-Hour	87	70	62	87	50
Annual	35.1	33.6	26.5	35.1	20
Particulates ($PM_{2.5}$)					
Annual	12.5	12.5	13.5	13.5	12

Note: Particulates (PM_{10} and $PM_{2.5}$) from the Perris Valley and Metropolitan Riverside County 1 Monitoring Stations, respectively, are expressed in micrograms per cubic meter ($\mu g/m^3$). All others are expressed in parts per million (ppm). NM – not monitored that particular year.
Source: SCAQMD, Historical Data by Year, http://www.aqmd.gov/home/library/air-quality-data-studies/historical-data-by-year.

For carbon monoxide (CO) and nitrogen dioxide (NO_2), background concentrations are below the current air quality standards. Therefore, impacts are considered to be significant when pollutant concentrations, added to existing background levels, result in an exceedance of the CAAQS.

For particulate emissions, maximum background concentrations in the vicinity of the site exceed the California Ambient Air Quality Standard (CAAQS) for the annual average averaging times for PM_{10} and $PM_{2.5}$, and the CAAQS for the 24-hour averaging time for PM_{10} concentrations. Additionally for PM_{10} and $PM_{2.5}$ emissions, the project site is within a non-attainment area for particulates (CARB, 2013). As a result,

SCAQMD defines a significant impact as PM_{10} and $PM_{2.5}$ concentrations that exceed the specified localized significance threshold (LST) of 2.5 μg/m^3, over an averaging time of 24 hours, and 1.0 μg/m^3, for annually averaged concentrations.

Appendix D, Table D5, presents the criteria air pollutant ground level concentrations at the project site determined using AERMOD.

6.4 ACCIDENTAL RELEASES

Under the auspices of the California Accidental Release Prevention (CalARP) Program, should a stationary source use more than a threshold quantity of a regulated hazardous substance, a Risk Management Plan (RMP) which includes a risk assessment of accidental releases is required to be conducted pursuant to the provisions of the federal Accidental Release Prevention program (Title 40, Code of Federal Regulations, Part 68) Article 2, Chapter 6.95 of the Health and Safety Code.

A review of the available information collected during the source identification process (e.g., regulatory records review and on-site interviews with business owner/operators) did not reveal the presence of any CalARP program facilities within 0.25 mile of the proposed site (Center of Effective Government, 2014).

6. Risk Characterizations

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7. Conclusions

The results of the health risk assessment are provided in Table 7. The excess cancer risk was calculated to be 0.48 per million for adult school staff and 1.13 per million for students. In comparison to the threshold level of 10 in a million, carcinogenic risks are well below the significance threshold value for both school staff and students. For non-carcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both school staff and students. Therefore, chronic non-carcinogenic hazards are below the significance threshold. Additionally, the acute 1-hour and 8-hour non-carcinogenic hazards were below the significance thresholds.

Table 7 Health Risk Assessment Results

Source	Cancer Risk (per million)		Chronic Hazard Index	Acute (1-Hour) Hazard Index	8-Hour Hazard Index
	Staff Exposure	Student Exposure			
State Route 79	0.48	1.13	0.003	0.012	0.002
SCAQMD Threshold	10	10	1.0	1.0	1.0
Exceeds Threshold	No	No	No	No	No

Source: Lakes AERMOD View, 9.1.0, 2015.

A comparison of the current air quality standards with the results of the modeling analysis for SR-79 vehicle emissions is provided below:

- For carbon monoxide (CO), the maximum one-hour concentration of 0.26 ppm and the maximum eight-hour concentration of 0.07 ppm, when added to existing background levels, do not exceed the CAAQS.

- For nitrogen dioxide (NO_2), maximum one-hour and annual concentrations of 0.004 ppm and 0.00005 ppm were calculated, respectively. These concentrations, when added to existing background levels, do not exceed the CAAQS.

- For PM_{10}, a maximum 24-hour concentration of 1.67 micrograms per cubic meter ($\mu g/m^3$) was predicted. The maximum 24-hour concentration does not exceed the SCAQMD significance threshold of 2.5 $\mu g/m^3$. Additionally, an annual average concentration of 0.28 $\mu g/m^3$ was predicted. The annual average concentration also does not exceed the SCAQMD significance threshold of 1.0 $\mu g/m^3$.

- For $PM_{2.5}$, a maximum 24-hour concentration of 0.39 $\mu g/m^3$ was predicted. The maximum 24-hour concentration for $PM_{2.5}$ does not exceed the SCAQMD significance threshold of 2.5 $\mu g/m^3$.

7. Conclusions

Based on a comparison to the carcinogenic and non-carcinogenic thresholds established by OEHHA and SCAQMD, hazardous air emissions generated from the stationary and mobile sources within a quarter-mile radius are not anticipated to pose an actual or potential endangerment to students and staff occupying the project site and no mitigation measures are required.

8. References

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Appendix A. Emission Rate Calculations

Appendix

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Vehicle Mix Worksheet

Table A: Traffic Volumes

Route	Mile Post	Traffic Data Year	Peak Hour Traffic (veh/hr)	Truck Percentage (%)	Annual Increase in Traffic (%)	School Buildout Year
State Route 79	7.63	2016	1,964	10.0%	5.6%	2017

Sources:

Traffic data from Traffic Impact Analysis for Temecula Valley Charter School (2016) and truck percentage from CalTrans, Traffic Data Branch (2014). Website: http://traffic-counts.dot.ca.gov.

Annual traffic increase based on projected growth rate to 7,212 peak hour trips by 2040 (ADT 75,600) from *2014 Final State Route 79 Realignment Supplemental Traffic Report* (Riverside County Transportation Commission), with realignment project approval.

Table B: Highway Parameters

Link/Segment	Link length (m)	Width of roadway (m)	Source Separation (m)	Roadway Configuration	Mile Post	Speed
State Route 79	999	18.5	18.5	At-Grade	7.63	65 mph

Table C: Segment Volumes

Link/Segment	Period Length (years)	Hourly All Vehicles	Hourly TOG Vehicles	Hourly Diesel Vehicles [4]
2017 [1]	3	**2,073**	**1,866**	207
2020 [1]	5	2,439	2,196	244
2025 [1]	5	3,199	2,879	320
2030 [1]	5	4,194	3,775	419
2035 [1]	5	5,500	4,950	550
2040 [1]	2	7,212	6,491	721
25-year weighted average [2]	25	3,892	**3,503**	**389**
9-year weighted average [3]	9	2,402	**2,162**	**240**

1 Increases in Peak Hourly Traffic based on projected growth rate to 7,212 peak hour trips by 2040 from *2014 Final State Route 79 Realignment Supplemental Traffic Report* (Riverside County Transportation Commission), with realignment project approval.

2 Represents the 25-year (staff) weighted average traffic volumes, accounting for annual increases in projected traffic.

3 Represents the 9-year (K-8th grade students) weighted average traffic volumes, accounting for annual increases in projected traffic.

4 Truck percentage of 10%, from CalTrans (2014), used to represent the diesel vehicle traffic along roadway segment.

Average Emission Factors
for School Based Receptors

Weighting Emission Factors

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

Risk Year	Modeling Year	Period	WF	Weighting Factor		55 mph - Emission Factors (g/mi)	
						TAC's	
				Period	Factor	TOG-gas	PM10-dsl
1	2017	1	0.040	2017-2019	0.120	**0.0448**	0.0539
2	2018	1	0.040				
3	2019	1	0.040				
4	2020	1	0.040	2020-2024	0.200	0.0328	0.0270
5	2021	1	0.040				
6	2022	1	0.040				
7	2023	1	0.040				
8	2024	1	0.040				
9	2025	1	0.040	2025-2029	0.200	0.0235	0.0058
10	2026	1	0.040				
11	2027	1	0.040				
12	2028	1	0.040				
13	2029	1	0.040				
14	2030	1	0.040	2030-2034	0.200	0.0193	0.0047
15	2031	1	0.040				
16	2032	1	0.040				
17	2033	1	0.040				
18	2034	1	0.040				
19	2035	1	0.040	2035-2039	0.200	0.0174	0.0042
20	2036	1	0.040				
21	2037	1	0.040				
22	2038	1	0.040				
23	2039	1	0.040				
24	2040	1	0.040	2040-2041	0.080	0.0163	0.0039
25	2041	1	0.040				
25-year average[1]		25	1.00		1.00	**0.0253**	**0.0151**
9-year average[2]		9				**0.0357**	**0.0336**

[1] Represent the 25-year (staff) weighted average emission factors for each TAC and vehicle speed.

[2] Represent the 9-year (K-8th grade) weighted average emission factors for each TAC and vehicle speed.

WF - period weighting factor

On-Road Mobile Sources
Emission Rate Computation

TOG Emissions

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

1 State Route 79

Link Length (meters)	999

Chronic - Long-term Emissions

Hourly Volume/Baseline (VPH) - Staff	3,503
Emission Factor (gr/mi) - Staff	0.0253
Hourly Emission Rate (gr/sec) - Staff	**1.53E-02**
Hourly Volume/Baseline (VPH) - Students	2,162
Emission Factor (gr/mi) - Students	0.0357
Hourly Emission Rate (gr/sec) - Students	**1.33E-02**

Acute - Short-term Emissions

Hourly Volume/Baseline (VPH) - 2017	1,866
Emission Factor (gr/mi) - 2017	0.0448
Hourly Emission Rate (gr/sec) - 2017	**1.44E-02**

On-Road Mobile Sources
Emission Rate Computation

DPM Emissions

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

1 State Route 79

Link Length (meters)	999
Hourly Volume/Baseline (VPH) - Staff	389
Emission Factor (gr/mi) - Staff	0.0151
Hourly Emission Rate (gr/sec) - Staff	**1.01E-03**
Hourly Volume/Baseline (VPH) - Students	240
Emission Factor (gr/mi) - Students	0.0336
Hourly Emission Rate (gr/sec) - Students	**1.39E-03**

On-Road Mobile Souces
Emission Rate Computation

Particulate (PM10) Emissions

For PM10 Reentrainment: Emission Factor (gr/mile) = (Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$

Particulate PM10 Base Emission Factor (gr/mi)	1.00
Road Surface Silt Loading (gr/m2)	0.02
Gross Vehicle Weight (tons)	2.4
PM10 Reentrainment Emission Factor (gr/mi)	0.069

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

1 State Route 79

Link Length (meters)	999
Peak Hour Volume/Baseline (VPH) - 2017	2,073
PM10 Vehicular Emission Factor (gr/mi) - 2017	0.0065
Peak Hour Pollutant Reentrainment Emission Rate (gr/sec)	2.48E-02
Peak Hour Pollutant Emission Rate (gr/sec)	2.32E-03
Peak Hour Pollutant Emission Rate Total (gr/sec)	**2.72E-02**

On-Road Mobile Souces
Emission Rate Computation

Particulate (PM2.5) Emissions

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

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

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

1 State Route 79

Link Length (meters)	999
Peak Hour Volume/Baseline (VPH) - 2017	2,073
PM2.5 Vehicular Emission Factor (gr/mi) - 2017	0.0061
Peak Hour Pollutant Reentrainment Emission Rate (gr/sec)	4.20E-03
Peak Hour Pollutant Emission Rate (gr/sec)	2.18E-03
Peak Hour Pollutant Emission Rate Total (gr/sec)	**6.38E-03**

On-Road Mobile Sources
Emission Rate Computation

CO Emissions

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

1 State Route 79

Link Length (meters)	999
Peak Hour Volume/Baseline (VPH) - 2017	2,073
Emission Factor (gr/mi) - 2017	1.0849
Peak Hour Emission Rate (gr/sec) - 2017	**3.88E-01**

On-Road Mobile Sources
Emission Rate Computation

NOx Emissions

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

1 State Route 79

Link Length (meters)	999
Peak Hour Volume/Baseline (VPH) - 2017	2,073
Emission Factor (gr/mi) - 2017	0.4986
Peak Hour Emission Rate (gr/sec) - 2017	**1.78E-01**

Initial Sigma Computation

Vertical Sigma Calculations - At-Grade or Above Grade Roadway

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

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

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

1 State Route 79

Width of Traveled Way (m)	18.5
Average Wind Speed (m/s)	1.85
Source Separation Distance (m)	18.5

SY = **8.60**
SZ = **2.70**

PeMS - 8/1/2015 - 10/31/2015: SR-79							Normalizing Factors HROFDAY Scalars [1]		
	All Vehicles VMT			Trucks VMT					
Hour	Southbound	Northbound	Total VMT	Southbound	Northbound	Total VMT	Hour	Vehicles	Trucks
0	23,180	23,770	46,950	0	0	0	1	0.280	0.000
1	20,847	19,766	40,613	0	0	0	2	0.242	0.000
2	21,077	18,532	39,609	0	0	0	3	0.236	0.000
3	26,023	19,110	45,133	0	0	0	4	0.269	0.000
4	40,777	23,955	64,732	44	0	44	5	0.385	0.039
5	63,555	33,874	97,430	285	0	285	6	0.580	0.253
6	76,064	50,206	126,269	458	31	489	7	0.752	0.433
7	89,252	58,616	147,868	697	129	826	8	0.880	0.732
8	89,795	55,952	145,747	681	47	729	9	0.868	0.646
9	79,393	57,630	137,022	509	56	565	10	0.816	0.501
10	76,090	59,303	135,393	462	64	526	11	0.806	0.466
11	75,866	62,938	138,804	455	113	568	12	0.827	0.503
12	75,297	66,710	142,007	450	216	666	13	0.846	0.590
13	75,867	69,208	145,076	462	294	756	14	0.864	0.670
14	82,501	74,798	157,299	549	412	962	15	0.937	0.852
15	82,434	83,002	165,435	557	516	1,072	16	0.985	0.950
16	84,652	83,206	167,859	578	512	1,090	17	1.000	0.965
17	83,664	84,275	**167,938**	579	549	**1,129**	**18**	**1.000**	**1.000**
18	76,342	75,699	152,040	492	433	926	19	0.905	0.820
19	60,860	65,749	126,609	239	249	488	20	0.754	0.432
20	48,094	58,028	106,122	52	101	153	21	0.632	0.135
21	41,623	49,594	91,217	13	23	36	22	0.543	0.032
22	34,335	39,368	73,702	2	6	8	23	0.439	0.007
23	28,289	30,565	58,853	1	1	1	24	0.350	0.001
Max	89,795	84,275	167,938	697	549	1,129			

[1] School Hours: 8:00 AM - 4:00 PM (Hour 9-16)

Peak Hour (CalTrans): Hour 17 (5PM - 6PM)
Peak Hour (AERMOD): Hour 18 (5PM - 6PM)

PeMS Report Description

Report	Aggregates>Time Series
Report link	http://pems.dot.ca.gov/?report_form=1&dnode=VDS&content=loops&statio
Report generated	8/24/2016 13:37
PeMS version	caltrans_pems-15.1.0

Report Parameters Southbound Segment

Parameter	Value
Quantity	Vehicle Miles Traveled (VMT)
Data	36,288 Lane Points
Data Quality	0% Observed
Segment Type	VDS
Segment Name	Mainline VDS 817812 - KELLER RD OC S/O
start date	8/1/2015 0:00
end date	10/31/2015 23:59
Day of Week	Mo,Tu,We,Th,Fr
Granularity	hour

Report Parameters Northbound Segment

Parameter	Value
Quantity	Vehicle Miles Traveled (VMT)
Data	36,288 Lane Points
Data Quality	0% Observed
Segment Type	VDS
Segment Name	Mainline VDS 817813 - KELLER RD OC S/O
start date	8/1/2015 0:00
end date	10/31/2015 23:59
Day of Week	Mo,Tu,We,Th,Fr
Granularity	hour

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT BY Axle 2	TRUCK AADT BY Axle 3	TRUCK AADT BY Axle 4	TRUCK AADT BY Axle 5+	% BY Axle 2	% BY Axle 3	% BY Axle 4	% BY Axle 5+	EAL 2-WAY (1000)	YEAR VER/ EST
079	11	SD	20.23	A	JCT. RTE. 78	2,800	314	11.20	219	48	21	26	69.60	15.40	6.80	8.20	24	88V
079	11	SD	27.37	B	JCT. RTE. 76 WEST	2,300	211	9.20	133	29	7	42	62.80	13.90	3.50	19.80	23	87V
079	11	SD	27.37	A	JCT. RTE. 76 WEST	2,350	277	11.80	176	39	18	44	63.60	14.10	6.40	15.90	28	87V
079	11	SD	31.7	A	SAN FELIPE RD	1,700	282	16.50	164	7	12	99	58.20	2.40	4.30	35.10	42	72V
079	08	RIV	2.27	B	JCT. RTE. 371 EAST	2,800	466	16.60	369	16	25	56	79.30	3.40	5.30	12.00	37	77E
079	08	RIV	2.27	A	JCT. RTE. 371 EAST	7,600	761	10.00	524	55	59	123	68.90	7.20	7.70	16.20	75	77E
079	08	RIV	R19.16	B	JCT. RTE. 74	7,800	663	8.50	414	78	13	158	62.40	11.80	1.90	23.90	78	91V
079	08	RIV	25.65	A	JCT. RTE. 74	16,500	1,568	9.50	1,032	196	249	91	65.80	12.50	15.90	5.80	122	87E
079	08	RIV	40.449	B	BEAUMONT, JCT. RTE. 10	28,000	2,912	10.40	1,482	280	93	1,057	50.90	9.60	3.20	36.30	456	91V
080	04	SF	3.951	A	SAN FRANCISCO, JCT. RTE. 101	167,000	4,842	2.90	2,208	586	179	1,869	45.60	12.10	3.70	38.60	802	94V
080	04	ALA	1.989	B	SAN FRANCISCO-OAKLAND BAY BRIDGE TOLL PLAZA	253,000	6,526	2.58	3,579	466	273	2,208	54.83	7.14	4.19	33.83	970	00V
080	04	ALA	1.989	A	SAN FRANCISCO-OAKLAND BAY BRIDGE TOLL PLAZA	253,000	6,350	2.51	2,836	447	201	2,866	44.66	7.04	3.17	45.13	1,159	03V
080	04	ALA	2.802	B	OAKLAND, JCT. RTE. 580 EAST	147,000	2,602	1.77	1,192	181	101	1,128	45.80	6.94	3.90	43.36	462	00V
080	04	ALA	3.786	A	EMERYVILLE, POWELL RD	277,000	13,267	4.79	5,041	1,165	491	6,570	37.99	8.78	3.70	49.52	2,622	03V
080	04	ALA	4.582	B	BERKELEY, JCT. RTE. 13 EAST	277,000	13,325	4.81	4,666	1,328	532	6,799	35.02	9.97	3.99	51.03	2,709	00V
080	04	ALA	4.582	A	BERKELEY, JCT. RTE. 13 EAST	269,000	12,831	4.77	4,927	1,125	512	6,267	38.40	8.77	3.99	48.84	2,513	03V

EMISSION FACTOR CALCULATIONS
EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Riverside
Calendar Year: 2017
Season: Annual
Vehicle Classification: EMFAC2007 Categories

TOTAL EMISSION RATES (g/mi)

Speed (mph): 55

Freeway Runex

	TOG	PM10	PM2.5	CO	NOx
Gas	**0.0448**				
DSL		**0.0539**			
Total		**0.0065**	**0.0061**	**1.0849**	**0.4986**

		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted	PM2.5 (g/mi)	PM2.5 Weighted	CO (g/mi)	CO Weighted	NOx (g/mi)	NOx Weighted
HHDT	GAS		1429	0.748388	1069	0.000654	1	0.00061	1	28.15313	40223	3.586412	5124
HHDT	DSL	0.570	320349	0.082947	26572	0.034726	11124	0.03322	10643	0.301776	96674	4.138121	1325643
LDA	GAS		2954677	0.021482	63471	0.001226	3622	0.00113	3333	0.753367	2225956	0.07394	218468
LDA	DSL	0.047	26173	0.021394	560	0.013014	341	0.01245	326	0.187999	4920	0.167448	4383
LDT1	GAS		242165	0.069218	16762	0.002575	624	0.00237	575	2.125997	514843	0.229188	55501
LDT1	DSL	0.000	202	0.184952	37	0.124146	25	0.11878	24	1.08804	219	1.193326	241
LDT2	GAS		1043715	0.028044	29270	0.001229	1283	0.00113	1180	0.992629	1036022	0.124223	129653
LDT2	DSL	0.003	1522	0.011387	17	0.005101	8	0.00488	7	0.079002	120	0.052455	80
LHDT1	GAS		80409	0.070715	5686	0.00111	89	0.00102	82	1.428689	114880	0.382455	30753
LHDT1	DSL	0.106	59628	0.130547	7784	0.026218	1563	0.02508	1496	0.783131	46696	5.07074	302358
LHDT2	GAS		13900	0.038903	541	0.000792	11	0.00073	10	0.773168	10747	0.261625	3636
LHDT2	DSL	0.041	22895	0.102244	2341	0.021432	491	0.02051	469	0.605508	13863	3.814546	87335
MCY	GAS		27239	2.322978	63276	0.001298	35	0.00122	33	20.26365	551968	1.145603	31205
MDV	GAS		771516	0.060201	46446	0.001346	1039	0.00124	957	1.795385	1385169	0.246489	190171
MDV	DSL	0.016	8837	0.01266	112	0.007329	65	0.00701	62	0.128844	1139	0.069158	611
MH	GAS		8896	0.204908	1823	0.001823	16	0.00169	15	5.412167	48146	0.785684	6989
MH	DSL	0.005	2550	0.080262	205	0.172419	440	0.16496	421	0.375558	958	5.539108	14127
MHDT	GAS		11320	0.165356	1872	0.000907	10	0.00084	9	3.549587	40180	0.909031	10290
MHDT	DSL	0.203	113931	0.153237	17458	0.140101	15962	0.13404	15271	0.514595	58628	3.515688	400545
OBUS	GAS		5414	0.079798	432	0.000552	3	0.00051	3	1.690257	9151	0.493771	2673
OBUS	DSL	0.006	3617	0.066727	241	0.03317	120	0.03173	115	0.205588	744	3.838335	13884
SBUS	GAS		683	0.064297	44	0.00046	0	0.00042	0	1.344031	918	0.393187	269
SBUS	DSL	0.003	1689	0.085544	144	0.054785	93	0.05242	89	0.213206	360	7.407689	12513
UBUS	GAS		595	0.529953	316	0.001257	1	0.00117	1	7.802398	4646	1.740284	1036
UBUS	DSL	0.001	605	1.159944	702	0.094222	57	0.09015	55	4.329371	2621	10.8084	6544
Gas Total			5161959		231008		6733		6200		5444743		741898
DSL Total		1.00	561998		56175		30288		28977		765048		2112135

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

EMISSION FACTOR CALCULATIONS
EMFAC 2014

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

TOTAL EMISSION RATES (g/mi)

Speed (mph)		Freeway Runex	
55		TOG	PM10
	Gas	**0.0328**	
	DSL		**0.0270**

		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		1583	0.527333	835	0.000579	1
HHDT	DSL	0.588	375857	0.056721	21319	0.016579	6231
LDA	GAS		3226909	0.013782	44473	0.001292	4168
LDA	DSL	0.053	33744	0.014838	501	0.008784	296
LDT1	GAS		238682	0.040427	9649	0.002113	504
LDT1	DSL	0.000	183	0.145643	27	0.097434	18
LDT2	GAS		1142600	0.018155	20744	0.001286	1470
LDT2	DSL	0.003	2054	0.009724	20	0.004127	8
LHDT1	GAS		66297	0.055533	3682	0.000991	66
LHDT1	DSL	0.086	54678	0.114315	6250	0.023338	1276
LHDT2	GAS		13010	0.023577	307	0.000717	9
LHDT2	DSL	0.034	22022	0.08164	1798	0.017924	395
MCY	GAS		28541	2.237881	63871	0.001443	41
MDV	GAS		746822	0.045103	33684	0.001344	1003
MDV	DSL	0.019	12099	0.010156	123	0.005667	69
MH	GAS		7529	0.137808	1038	0.001368	10
MH	DSL	0.003	2232	0.075606	169	0.162033	362
MHDT	GAS		12933	0.095949	1241	0.000768	10
MHDT	DSL	0.202	129208	0.062564	8084	0.065198	8424
OBUS	GAS		6060	0.047361	287	0.000628	4
OBUS	DSL	0.007	4477	0.038273	171	0.01465	66
SBUS	GAS		726	0.043835	32	0.000403	0
SBUS	DSL	0.003	1689	0.049854	84	0.030831	52
UBUS	GAS		639	0.419838	268	0.001175	1
UBUS	DSL	0.001	634	0.901999	572	0.058601	37

Gas Total		5492331		180109	7287
DSL Total	1.00	638878		39117	17234

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

EMISSION FACTOR CALCULATIONS
EMFAC 2014

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

TOTAL EMISSION RATES (g/mi)

Speed (mph)		Freeway Runex	
55		TOG	PM10
	Gas	**0.0235**	
	DSL		**0.0058**

		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		1807	0.367544	664	0.000702	1
HHDT	DSL	0.617	433536	0.032373	14035	0.004925	2135
LDA	GAS		3161811	0.008922	28210	0.001282	4052
LDA	DSL	0.055	38959	0.007389	288	0.004075	159
LDT1	GAS		220346	0.021773	4798	0.001649	363
LDT1	DSL	0.000	148	0.086591	13	0.057191	8
LDT2	GAS		1173322	0.011794	13838	0.001286	1508
LDT2	DSL	0.003	2443	0.008557	21	0.003479	8
LHDT1	GAS		45310	0.033079	1499	0.000883	40
LHDT1	DSL	0.065	45576	0.082999	3783	0.017515	798
LHDT2	GAS		11081	0.010795	120	0.000724	8
LHDT2	DSL	0.028	19836	0.051155	1015	0.012334	245
MCY	GAS		27161	2.159074	58642	0.001603	44
MDV	GAS		658712	0.024198	15940	0.00127	837
MDV	DSL	0.021	14711	0.006153	91	0.003158	46
MH	GAS		5566	0.070887	395	0.001025	6
MH	DSL	0.002	1648	0.063319	104	0.130436	215
MHDT	GAS		14273	0.037888	541	0.000757	11
MHDT	DSL	0.197	138512	0.01374	1903	0.002697	374
OBUS	GAS		6500	0.022016	143	0.000743	5
OBUS	DSL	0.008	5334	0.019025	101	0.003237	17
SBUS	GAS		792	0.028178	22	0.000442	0
SBUS	DSL	0.002	1690	0.037244	63	0.021987	37
UBUS	GAS		633	0.222602	141	0.000839	1
UBUS	DSL	0.001	624	0.589211	367	0.032439	20

Gas Total		5327314	124952		6876
DSL Total	1.00	703016	21784		4064

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

EMISSION FACTOR CALCULATIONS
EMFAC 2014

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

TOTAL EMISSION RATES (g/mi)

Speed (mph)		Freeway Runex	
55		TOG	PM10
	Gas	**0.0193**	
	DSL		**0.0047**

		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2100	0.339022	712	0.000789	2
HHDT	DSL	0.627	477023	0.031392	14975	0.004697	2241
LDA	GAS		3350529	0.006445	21594	0.000989	3314
LDA	DSL	0.058	44335	0.003663	162	0.001453	64
LDT1	GAS		232824	0.0127	2957	0.001159	270
LDT1	DSL	0.000	125	0.015171	2	0.007238	1
LDT2	GAS		1297811	0.008397	10898	0.000986	1280
LDT2	DSL	0.004	2808	0.008156	23	0.003255	9
LHDT1	GAS		36091	0.016935	611	0.000838	30
LHDT1	DSL	0.056	42794	0.056327	2410	0.012024	515
LHDT2	GAS		10938	0.00564	62	0.000784	9
LHDT2	DSL	0.026	19852	0.032671	649	0.008373	166
MCY	GAS		28977	2.118422	61385	0.001696	49
MDV	GAS		676922	0.015739	10654	0.001033	699
MDV	DSL	0.023	17401	0.00402	70	0.001643	29
MH	GAS		4750	0.025938	123	0.00084	4
MH	DSL	0.002	1342	0.048059	65	0.085376	115
MHDT	GAS		16014	0.018331	294	0.000793	13
MHDT	DSL	0.193	146738	0.013762	2019	0.002634	386
OBUS	GAS		7114	0.013359	95	0.000804	6
OBUS	DSL	0.008	5887	0.018291	108	0.003116	18
SBUS	GAS		817	0.015522	13	0.000533	0
SBUS	DSL	0.002	1690	0.024276	41	0.012616	21
UBUS	GAS		672	0.063579	43	0.000782	1
UBUS	DSL	0.001	653	0.412193	269	0.009738	6
Gas Total			5665559		109440		5676
DSL Total		1.00	760649		20793		3572

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

EMISSION FACTOR CALCULATIONS
EMFAC 2014

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

TOTAL EMISSION RATES (g/mi)

Speed (mph)		Freeway Runex	
55		TOG	PM10
	Gas	**0.0174**	
	DSL		**0.0042**

		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		2924	0.347147	1015	0.000825	2
HHDT	DSL	0.637	601233	0.030656	18431	0.004511	2712
LDA	GAS		3733478	0.004939	18441	0.000722	2695
LDA	DSL	0.054	51018	0.002776	142	0.000856	44
LDT1	GAS		263368	0.007388	1946	0.000792	209
LDT1	DSL	0.000	144	0.009537	1	0.004062	1
LDT2	GAS		1492898	0.006423	9588	0.000721	1076
LDT2	DSL	0.003	3262	0.00808	26	0.003231	11
LHDT1	GAS		35738	0.00781	279	0.000804	29
LHDT1	DSL	0.052	48824	0.039507	1929	0.008169	399
LHDT2	GAS		12569	0.003876	49	0.000818	10
LHDT2	DSL	0.025	23791	0.025742	612	0.006415	153
MCY	GAS		33654	2.097121	70578	0.001752	59
MDV	GAS		763351	0.011254	8590	0.000793	606
MDV	DSL	0.022	20745	0.003277	68	0.001105	23
MH	GAS		5048	0.015906	80	0.000806	4
MH	DSL	0.002	1437	0.036109	52	0.049315	71
MHDT	GAS		22102	0.012489	276	0.000818	18
MHDT	DSL	0.194	182679	0.013664	2496	0.002576	471
OBUS	GAS		9167	0.011001	101	0.00083	8
OBUS	DSL	0.009	8032	0.016932	136	0.00288	23
SBUS	GAS		802	0.009209	7	0.000659	1
SBUS	DSL	0.002	1691	0.015763	27	0.005016	8
UBUS	GAS		843	0.046935	40	0.000815	1
UBUS	DSL	0.001	829	0.331707	275	0.003849	3
Gas Total			6375943		110991		4717
DSL Total		1.00	943685		24196		3918

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

EMISSION FACTOR CALCULATIONS
EMFAC 2014

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

TOTAL EMISSION RATES (g/mi)

Speed (mph)		Freeway Runex	
55		TOG	PM10
	Gas	**0.0163**	
	DSL		**0.0039**

		Fleet Mix Percentage	VMT (Mi/day)	TOG (g/mi)	TOG Weighted	PM10 (g/mi)	PM10 Weighted
HHDT	GAS		3201	0.353137	1131	0.000838	3
HHDT	DSL	0.641	649756	0.030507	19822	0.004476	2909
LDA	GAS		3978282	0.004206	16734	0.000568	2259
LDA	DSL	0.054	55107	0.002479	137	0.000635	35
LDT1	GAS		282188	0.005222	1474	0.000611	172
LDT1	DSL	0.000	156	0.008642	1	0.003577	1
LDT2	GAS		1607572	0.005414	8703	0.000567	911
LDT2	DSL	0.003	3527	0.008083	29	0.003242	11
LHDT1	GAS		35525	0.004274	152	0.000811	29
LHDT1	DSL	0.050	50779	0.030931	1571	0.006063	308
LHDT2	GAS		13409	0.003413	46	0.000835	11
LHDT2	DSL	0.025	25405	0.02369	602	0.005598	142
MCY	GAS		36197	2.089404	75629	0.001779	64
MDV	GAS		818343	0.008438	6905	0.000632	518
MDV	DSL	0.022	22735	0.002906	66	0.000815	19
MH	GAS		5182	0.010941	57	0.000815	4
MH	DSL	0.001	1438	0.02934	42	0.030192	43
MHDT	GAS		24136	0.010431	252	0.000833	20
MHDT	DSL	0.191	193966	0.013429	2605	0.002509	487
OBUS	GAS		9893	0.010499	104	0.000838	8
OBUS	DSL	0.008	8573	0.016977	146	0.002889	25
SBUS	GAS		777	0.009197	7	0.000793	1
SBUS	DSL	0.002	1691	0.012631	21	0.002364	4
UBUS	GAS		904	0.019349	18	0.000816	1
UBUS	DSL	0.001	890	0.285975	254	0.001198	1
Gas Total			6815610		111210		4001
DSL Total		1.00	1014022		25295		3984

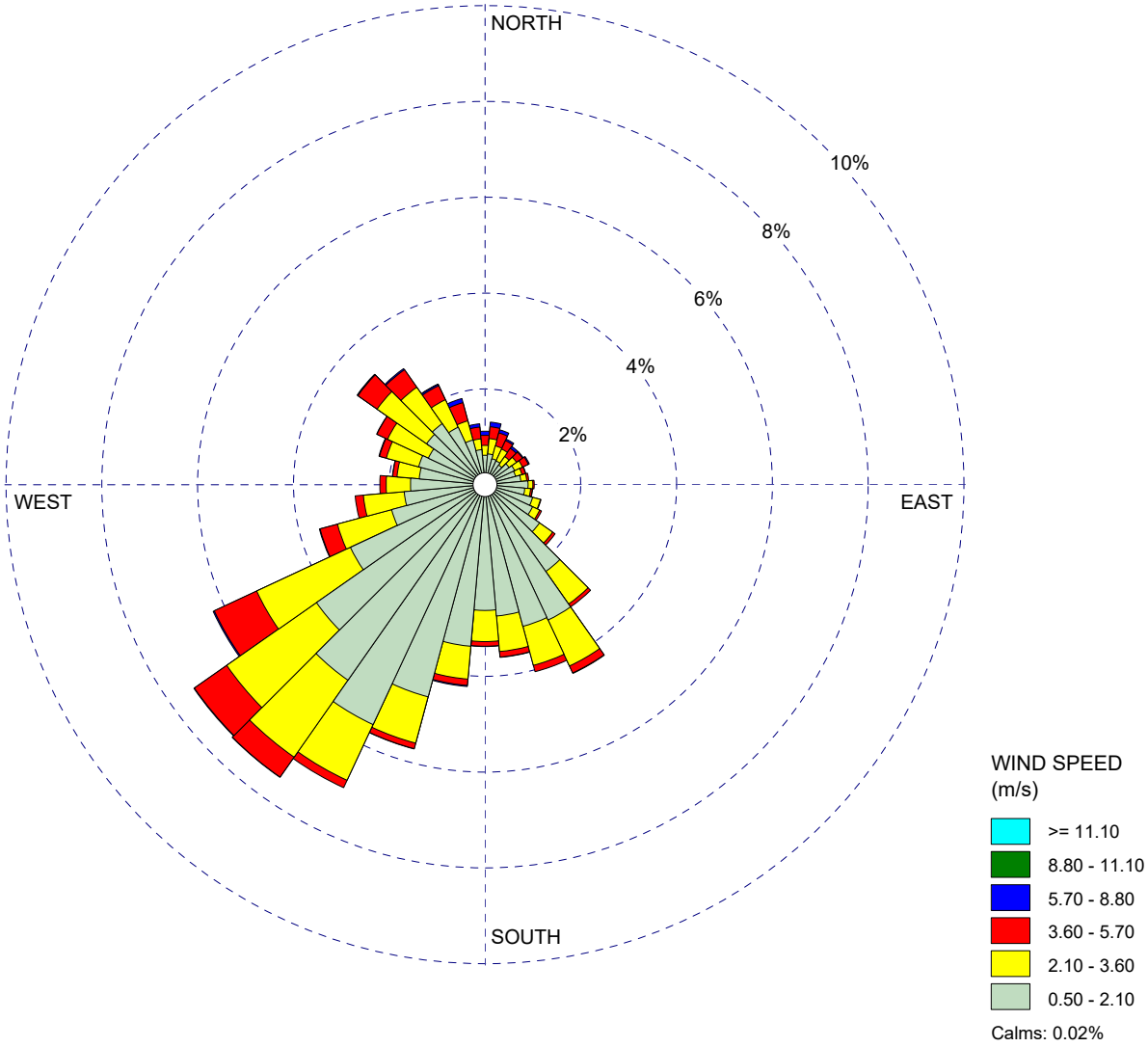
Note: Total Emission Rate (g/mi)=Sum of Weighted Emission Rates(g/day)/Sum of VMTs(mi/day)

WIND ROSE PLOT:

Lake Elsinore Met Data

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD: **Start Date: 1/1/2008 - 08:00** **End Date: 12/31/2012 - 15:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.02%**	TOTAL COUNT: **14476 hrs.**	
	AVG. WIND SPEED: **1.85 m/s**	DATE: **8/26/2016**	PROJECT NO.:

Appendix

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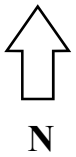
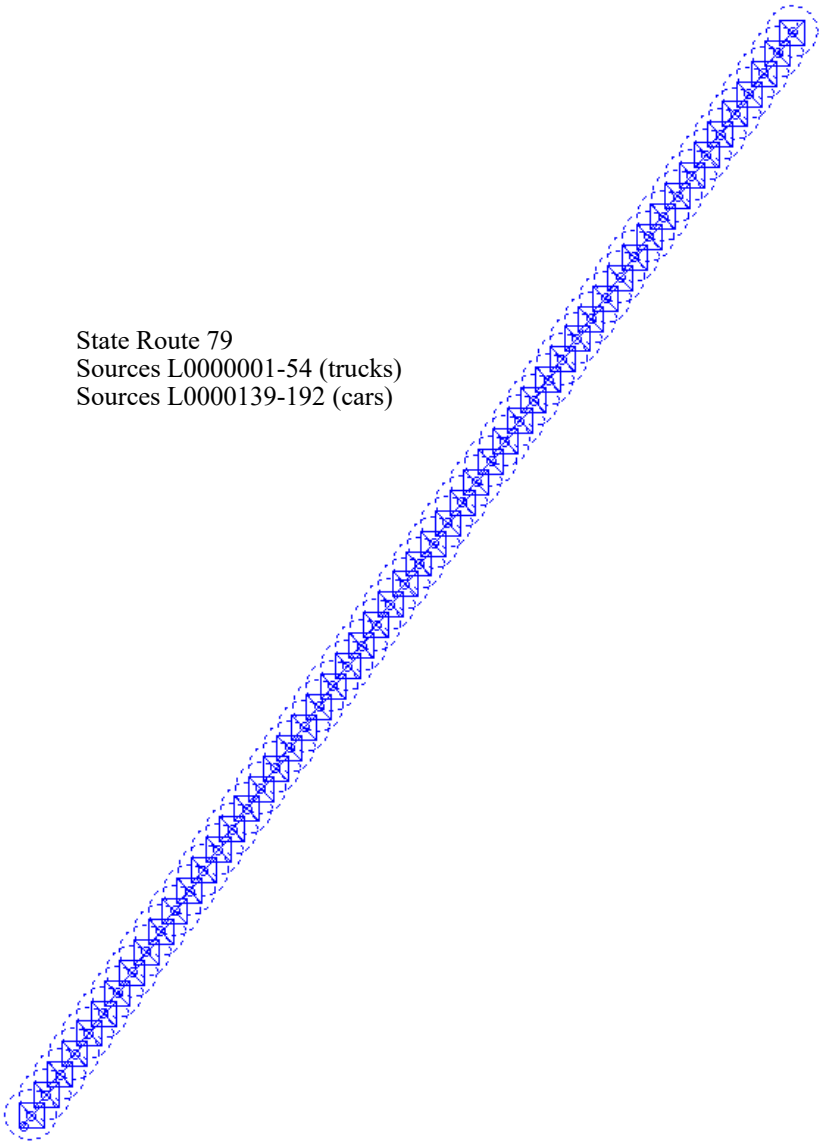
Appendix B. Graphical Representations of Emitting Sources

State Route 79
Mile Post 7.63
Sources L0000001-54 (trucks); Sources L0000139-192 (cars)





- Release height of 4.15 m and initial vertical dimension (δy) of 1.93 m is based upon California Air Resources Board's "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles" (2000). Release of 0.6 m used for gasoline-fueled vehicles.

Appendix C. Air Dispersion Modeling Output

Appendix

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Results Summary

C:\Users\GraphicsBRK\Desktop\TVCS_HRA\TVCS_HRA.isc

Concentration - Source Group: 1A - Trucks

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	405.71762	ug/m^3	491119.30	3720583.78	432.83	0.00	575.00	12/21/2010, 16
8-HR	1ST	115.92715	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	12/21/2010, 16
24-HR	1ST	35.28218	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	12/21/2010, 24
PERIOD		6.87765	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	

Concentration - Source Group: 1B - Cars

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
1-HR	1ST	763.15851	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	12/21/2010, 16
8-HR	1ST	201.66174	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	12/21/2010, 16
24-HR	1ST	61.37531	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	12/21/2010, 24
PERIOD		10.41932	ug/m^3	491009.74	3720425.54	432.77	0.00	521.00	

Model Output
Unit Emission Rates (1 g/s)

```
*** AERMOD - VERSION  15181 ***   *** C:\Users\GraphicsBRK\Desktop\TVCS_HRA\TVCS_HRA.isc                  ***        08/26/16
*** AERMET - VERSION  14134 ***   ***                                                                    ***        10:24:31
                                                                                                                  PAGE   1
 **MODELOPTs:   RegDFAULT CONC      ELEV      RURAL

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

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

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

 **Model Uses RURAL Dispersion Only.

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

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

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  OTHER

 **Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR
     and Calculates PERIOD Averages

 **This Run Includes:    108 Source(s);       2 Source Group(s); and     364 Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:    108 VOLUME source(s)
                 and:      0 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)


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

 **The AERMET Input Meteorological Data Version Date:  14134

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

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

Model Output
Unit Emission Rates (1 g/s)

```
**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =   406.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                              ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      3.7 MB of RAM.

**Detailed Error/Message File:   TVCS_HRA.err
**File for Summary of Results:   TVCS_HRA.sum
```

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0000001	0	0.18519E-01	490800.1	3720092.4	424.9	4.15	8.60	2.70	NO	HRDOW
L0000002	0	0.18519E-01	490810.8	3720107.5	425.1	4.15	8.60	2.70	NO	HRDOW
L0000003	0	0.18519E-01	490821.4	3720122.7	425.6	4.15	8.60	2.70	NO	HRDOW
L0000004	0	0.18519E-01	490832.0	3720137.8	426.0	4.15	8.60	2.70	NO	HRDOW
L0000005	0	0.18519E-01	490842.6	3720152.9	426.0	4.15	8.60	2.70	NO	HRDOW
L0000006	0	0.18519E-01	490853.3	3720168.1	426.0	4.15	8.60	2.70	NO	HRDOW
L0000007	0	0.18519E-01	490863.9	3720183.2	426.0	4.15	8.60	2.70	NO	HRDOW
L0000008	0	0.18519E-01	490874.5	3720198.4	426.1	4.15	8.60	2.70	NO	HRDOW
L0000009	0	0.18519E-01	490885.1	3720213.5	426.3	4.15	8.60	2.70	NO	HRDOW
L0000010	0	0.18519E-01	490895.8	3720228.7	426.2	4.15	8.60	2.70	NO	HRDOW
L0000011	0	0.18519E-01	490906.4	3720243.8	426.8	4.15	8.60	2.70	NO	HRDOW
L0000012	0	0.18519E-01	490917.0	3720258.9	427.7	4.15	8.60	2.70	NO	HRDOW
L0000013	0	0.18519E-01	490927.7	3720274.1	429.0	4.15	8.60	2.70	NO	HRDOW
L0000014	0	0.18519E-01	490938.3	3720289.2	430.8	4.15	8.60	2.70	NO	HRDOW
L0000015	0	0.18519E-01	490948.9	3720304.4	431.7	4.15	8.60	2.70	NO	HRDOW
L0000016	0	0.18519E-01	490959.5	3720319.5	432.1	4.15	8.60	2.70	NO	HRDOW
L0000017	0	0.18519E-01	490970.2	3720334.7	432.5	4.15	8.60	2.70	NO	HRDOW
L0000018	0	0.18519E-01	490980.8	3720349.8	432.4	4.15	8.60	2.70	NO	HRDOW
L0000019	0	0.18519E-01	490991.4	3720364.9	432.6	4.15	8.60	2.70	NO	HRDOW
L0000020	0	0.18519E-01	491002.0	3720380.1	432.9	4.15	8.60	2.70	NO	HRDOW
L0000021	0	0.18519E-01	491012.7	3720395.2	432.5	4.15	8.60	2.70	NO	HRDOW
L0000022	0	0.18519E-01	491023.3	3720410.4	431.9	4.15	8.60	2.70	NO	HRDOW
L0000023	0	0.18519E-01	491033.9	3720425.5	431.8	4.15	8.60	2.70	NO	HRDOW
L0000024	0	0.18519E-01	491044.6	3720440.7	431.4	4.15	8.60	2.70	NO	HRDOW
L0000025	0	0.18519E-01	491055.2	3720455.8	430.8	4.15	8.60	2.70	NO	HRDOW
L0000026	0	0.18519E-01	491065.8	3720470.9	430.4	4.15	8.60	2.70	NO	HRDOW
L0000027	0	0.18519E-01	491076.4	3720486.1	429.6	4.15	8.60	2.70	NO	HRDOW
L0000028	0	0.18519E-01	491087.1	3720501.2	429.2	4.15	8.60	2.70	NO	HRDOW
L0000029	0	0.18519E-01	491097.7	3720516.4	429.7	4.15	8.60	2.70	NO	HRDOW
L0000030	0	0.18519E-01	491108.3	3720531.5	430.2	4.15	8.60	2.70	NO	HRDOW
L0000031	0	0.18519E-01	491118.9	3720546.7	430.4	4.15	8.60	2.70	NO	HRDOW
L0000032	0	0.18519E-01	491129.6	3720561.8	430.9	4.15	8.60	2.70	NO	HRDOW
L0000033	0	0.18519E-01	491140.2	3720576.9	432.1	4.15	8.60	2.70	NO	HRDOW
L0000034	0	0.18519E-01	491150.8	3720592.1	433.3	4.15	8.60	2.70	NO	HRDOW
L0000035	0	0.18519E-01	491161.5	3720607.2	433.7	4.15	8.60	2.70	NO	HRDOW
L0000036	0	0.18519E-01	491172.1	3720622.4	433.7	4.15	8.60	2.70	NO	HRDOW
L0000037	0	0.18519E-01	491182.7	3720637.5	432.6	4.15	8.60	2.70	NO	HRDOW
L0000038	0	0.18519E-01	491193.3	3720652.7	431.4	4.15	8.60	2.70	NO	HRDOW
L0000039	0	0.18519E-01	491204.0	3720667.8	431.0	4.15	8.60	2.70	NO	HRDOW
L0000040	0	0.18519E-01	491214.6	3720682.9	431.0	4.15	8.60	2.70	NO	HRDOW

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0000041	0	0.18519E-01	491225.2	3720698.1	430.5	4.15	8.60	2.70	NO	HRDOW
L0000042	0	0.18519E-01	491235.8	3720713.2	430.4	4.15	8.60	2.70	NO	HRDOW
L0000043	0	0.18519E-01	491246.5	3720728.4	430.7	4.15	8.60	2.70	NO	HRDOW
L0000044	0	0.18519E-01	491257.1	3720743.5	430.2	4.15	8.60	2.70	NO	HRDOW
L0000045	0	0.18519E-01	491267.7	3720758.7	429.9	4.15	8.60	2.70	NO	HRDOW
L0000046	0	0.18519E-01	491278.4	3720773.8	430.1	4.15	8.60	2.70	NO	HRDOW
L0000047	0	0.18519E-01	491289.0	3720788.9	430.0	4.15	8.60	2.70	NO	HRDOW
L0000048	0	0.18519E-01	491299.6	3720804.1	430.5	4.15	8.60	2.70	NO	HRDOW
L0000049	0	0.18519E-01	491310.2	3720819.2	431.1	4.15	8.60	2.70	NO	HRDOW
L0000050	0	0.18519E-01	491320.9	3720834.4	431.6	4.15	8.60	2.70	NO	HRDOW
L0000051	0	0.18519E-01	491331.5	3720849.5	432.2	4.15	8.60	2.70	NO	HRDOW
L0000052	0	0.18519E-01	491342.1	3720864.7	432.6	4.15	8.60	2.70	NO	HRDOW
L0000053	0	0.18519E-01	491352.8	3720879.8	432.8	4.15	8.60	2.70	NO	HRDOW
L0000054	0	0.18519E-01	491363.4	3720894.9	433.3	4.15	8.60	2.70	NO	HRDOW
L0000139	0	0.18519E-01	490800.1	3720092.4	424.9	0.60	8.60	2.70	NO	HRDOW
L0000140	0	0.18519E-01	490810.8	3720107.5	425.1	0.60	8.60	2.70	NO	HRDOW
L0000141	0	0.18519E-01	490821.4	3720122.7	425.6	0.60	8.60	2.70	NO	HRDOW
L0000142	0	0.18519E-01	490832.0	3720137.8	426.0	0.60	8.60	2.70	NO	HRDOW
L0000143	0	0.18519E-01	490842.6	3720152.9	426.0	0.60	8.60	2.70	NO	HRDOW
L0000144	0	0.18519E-01	490853.3	3720168.1	426.0	0.60	8.60	2.70	NO	HRDOW
L0000145	0	0.18519E-01	490863.9	3720183.2	426.0	0.60	8.60	2.70	NO	HRDOW
L0000146	0	0.18519E-01	490874.5	3720198.4	426.1	0.60	8.60	2.70	NO	HRDOW
L0000147	0	0.18519E-01	490885.1	3720213.5	426.3	0.60	8.60	2.70	NO	HRDOW
L0000148	0	0.18519E-01	490895.8	3720228.7	426.2	0.60	8.60	2.70	NO	HRDOW
L0000149	0	0.18519E-01	490906.4	3720243.8	426.8	0.60	8.60	2.70	NO	HRDOW
L0000150	0	0.18519E-01	490917.0	3720258.9	427.7	0.60	8.60	2.70	NO	HRDOW
L0000151	0	0.18519E-01	490927.7	3720274.1	429.0	0.60	8.60	2.70	NO	HRDOW
L0000152	0	0.18519E-01	490938.3	3720289.2	430.8	0.60	8.60	2.70	NO	HRDOW
L0000153	0	0.18519E-01	490948.9	3720304.4	431.7	0.60	8.60	2.70	NO	HRDOW
L0000154	0	0.18519E-01	490959.5	3720319.5	432.1	0.60	8.60	2.70	NO	HRDOW
L0000155	0	0.18519E-01	490970.2	3720334.7	432.5	0.60	8.60	2.70	NO	HRDOW
L0000156	0	0.18519E-01	490980.8	3720349.8	432.4	0.60	8.60	2.70	NO	HRDOW
L0000157	0	0.18519E-01	490991.4	3720364.9	432.6	0.60	8.60	2.70	NO	HRDOW
L0000158	0	0.18519E-01	491002.0	3720380.1	432.9	0.60	8.60	2.70	NO	HRDOW
L0000159	0	0.18519E-01	491012.7	3720395.2	432.5	0.60	8.60	2.70	NO	HRDOW
L0000160	0	0.18519E-01	491023.3	3720410.4	431.9	0.60	8.60	2.70	NO	HRDOW
L0000161	0	0.18519E-01	491033.9	3720425.5	431.8	0.60	8.60	2.70	NO	HRDOW
L0000162	0	0.18519E-01	491044.6	3720440.7	431.4	0.60	8.60	2.70	NO	HRDOW
L0000163	0	0.18519E-01	491055.2	3720455.8	430.8	0.60	8.60	2.70	NO	HRDOW
L0000164	0	0.18519E-01	491065.8	3720470.9	430.4	0.60	8.60	2.70	NO	HRDOW

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	INIT. SY (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
L0000165	0	0.18519E-01	491076.4	3720486.1	429.6	0.60	8.60	2.70	NO	HRDOW
L0000166	0	0.18519E-01	491087.1	3720501.2	429.2	0.60	8.60	2.70	NO	HRDOW
L0000167	0	0.18519E-01	491097.7	3720516.4	429.7	0.60	8.60	2.70	NO	HRDOW
L0000168	0	0.18519E-01	491108.3	3720531.5	430.2	0.60	8.60	2.70	NO	HRDOW
L0000169	0	0.18519E-01	491118.9	3720546.7	430.4	0.60	8.60	2.70	NO	HRDOW
L0000170	0	0.18519E-01	491129.6	3720561.8	430.9	0.60	8.60	2.70	NO	HRDOW
L0000171	0	0.18519E-01	491140.2	3720576.9	432.1	0.60	8.60	2.70	NO	HRDOW
L0000172	0	0.18519E-01	491150.8	3720592.1	433.3	0.60	8.60	2.70	NO	HRDOW
L0000173	0	0.18519E-01	491161.5	3720607.2	433.7	0.60	8.60	2.70	NO	HRDOW
L0000174	0	0.18519E-01	491172.1	3720622.4	433.7	0.60	8.60	2.70	NO	HRDOW
L0000175	0	0.18519E-01	491182.7	3720637.5	432.6	0.60	8.60	2.70	NO	HRDOW
L0000176	0	0.18519E-01	491193.3	3720652.7	431.4	0.60	8.60	2.70	NO	HRDOW
L0000177	0	0.18519E-01	491204.0	3720667.8	431.0	0.60	8.60	2.70	NO	HRDOW
L0000178	0	0.18519E-01	491214.6	3720682.9	431.0	0.60	8.60	2.70	NO	HRDOW
L0000179	0	0.18519E-01	491225.2	3720698.1	430.5	0.60	8.60	2.70	NO	HRDOW
L0000180	0	0.18519E-01	491235.8	3720713.2	430.4	0.60	8.60	2.70	NO	HRDOW
L0000181	0	0.18519E-01	491246.5	3720728.4	430.7	0.60	8.60	2.70	NO	HRDOW
L0000182	0	0.18519E-01	491257.1	3720743.5	430.2	0.60	8.60	2.70	NO	HRDOW
L0000183	0	0.18519E-01	491267.7	3720758.7	429.9	0.60	8.60	2.70	NO	HRDOW
L0000184	0	0.18519E-01	491278.4	3720773.8	430.1	0.60	8.60	2.70	NO	HRDOW
L0000185	0	0.18519E-01	491289.0	3720788.9	430.0	0.60	8.60	2.70	NO	HRDOW
L0000186	0	0.18519E-01	491299.6	3720804.1	430.5	0.60	8.60	2.70	NO	HRDOW
L0000187	0	0.18519E-01	491310.2	3720819.2	431.1	0.60	8.60	2.70	NO	HRDOW
L0000188	0	0.18519E-01	491320.9	3720834.4	431.6	0.60	8.60	2.70	NO	HRDOW
L0000189	0	0.18519E-01	491331.5	3720849.5	432.2	0.60	8.60	2.70	NO	HRDOW
L0000190	0	0.18519E-01	491342.1	3720864.7	432.6	0.60	8.60	2.70	NO	HRDOW
L0000191	0	0.18519E-01	491352.8	3720879.8	432.8	0.60	8.60	2.70	NO	HRDOW
L0000192	0	0.18519E-01	491363.4	3720894.9	433.3	0.60	8.60	2.70	NO	HRDOW

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
1A	L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 ,
	L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 ,
	L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 ,
	L0000025 , L0000026 , L0000027 , L0000028 , L0000029 , L0000030 , L0000031 , L0000032 ,
	L0000033 , L0000034 , L0000035 , L0000036 , L0000037 , L0000038 , L0000039 , L0000040 ,
	L0000041 , L0000042 , L0000043 , L0000044 , L0000045 , L0000046 , L0000047 , L0000048 ,
	L0000049 , L0000050 , L0000051 , L0000052 , L0000053 , L0000054 ,
1B	L0000139 , L0000140 , L0000141 , L0000142 , L0000143 , L0000144 , L0000145 , L0000146 ,
	L0000147 , L0000148 , L0000149 , L0000150 , L0000151 , L0000152 , L0000153 , L0000154 ,
	L0000155 , L0000156 , L0000157 , L0000158 , L0000159 , L0000160 , L0000161 , L0000162 ,
	L0000163 , L0000164 , L0000165 , L0000166 , L0000167 , L0000168 , L0000169 , L0000170 ,
	L0000171 , L0000172 , L0000173 , L0000174 , L0000175 , L0000176 , L0000177 , L0000178 ,
	L0000179 , L0000180 , L0000181 , L0000182 , L0000183 , L0000184 , L0000185 , L0000186 ,
	L0000187 , L0000188 , L0000189 , L0000190 , L0000191 , L0000192 ,

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC ELEV RURAL

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

SOURCE ID = Trucks (Sources L0000001 through L0000054) ; SOURCE TYPE = VOLUME :

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR
DAY OF WEEK = WEEKDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.6460E+00	10	.5010E+00	11	.4660E+00	12	.5030E+00	13	.5900E+00	14	.6700E+00	15	.8520E+00	16	.9500E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = SATURDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = SUNDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

SOURCE ID = Cars (Sources L0000139 through L0000192) ; SOURCE TYPE = VOLUME :

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR
DAY OF WEEK = WEEKDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.8680E+00	10	.8160E+00	11	.8060E+00	12	.8270E+00	13	.8460E+00	14	.8640E+00	15	.9370E+00	16	.9850E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = SATURDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = SUNDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.0000E+00	10	.0000E+00	11	.0000E+00	12	.0000E+00	13	.0000E+00	14	.0000E+00	15	.0000E+00	16	.0000E+00
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

**MODELOPTs: RegDFAULT CONC ELEV RURAL

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

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

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

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

1.54, 3.09, 5.14, 8.23, 10.80,

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

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

  Surface file: elsi8.sfc   Met Version: 14134
  Profile file: elsi8.PFL
  Surface format: FREE
  Profile format: FREE
  Surface station no.:   0   Upper air station no.:   3190
                Name: LAKE_ELSINORE   Name: UNKNOWN
                Year: 2008   Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	284.2	5.5
08	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.1	5.5
08	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.1	5.5
08	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.8	5.5
08	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.8	5.5
08	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.8	5.5
08	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.1	5.5
08	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	0.54	999.00	999.	-9.0	283.8	5.5
08	01	01	1	09	27.2	-9.000	-9.000	-9.000	60.	-999.	-99999.0	0.23	1.00	0.33	999.00	999.	-9.0	285.9	5.5
08	01	01	1	10	74.6	-9.000	-9.000	-9.000	157.	-999.	-99999.0	0.23	1.00	0.25	999.00	999.	-9.0	288.1	5.5
08	01	01	1	11	107.4	-9.000	-9.000	-9.000	375.	-999.	-99999.0	0.23	1.00	0.23	999.00	999.	-9.0	289.9	5.5
08	01	01	1	12	122.7	-9.000	-9.000	-9.000	578.	-999.	-99999.0	0.23	1.00	0.22	999.00	999.	-9.0	289.9	5.5
08	01	01	1	13	121.3	-9.000	-9.000	-9.000	714.	-999.	-99999.0	0.23	1.00	0.22	999.00	999.	-9.0	291.4	5.5
08	01	01	1	14	102.1	-9.000	-9.000	-9.000	763.	-999.	-99999.0	0.23	1.00	0.23	999.00	999.	-9.0	292.0	5.5
08	01	01	1	15	65.8	-9.000	-9.000	-9.000	792.	-999.	-99999.0	0.23	1.00	0.27	999.00	999.	-9.0	291.4	5.5
08	01	01	1	16	16.0	-9.000	-9.000	-9.000	798.	-999.	-99999.0	0.23	1.00	0.36	999.00	999.	-9.0	290.4	5.5
08	01	01	1	17	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	0.63	999.00	999.	-9.0	288.8	5.5
08	01	01	1	18	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	287.5	5.5
08	01	01	1	19	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	286.4	5.5
08	01	01	1	20	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	285.4	5.5
08	01	01	1	21	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	284.2	5.5
08	01	01	1	22	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.1	5.5
08	01	01	1	23	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	283.1	5.5
08	01	01	1	24	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.23	1.00	1.00	999.00	999.	-9.0	282.5	5.5

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	5.5	0	-999.	-99.00	284.3	99.0	-99.00	-99.00
08	01	01	01	9.1	1	-999.	-99.00	-999.0	99.0	-99.00	-99.00

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

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** THE SUMMARY OF MAXIMUM PERIOD (43848 HRS) RESULTS ***

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

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
1A	1ST HIGHEST VALUE IS	6.87765 AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	6.87042 AT (491064.52, 3720504.66, 430.04, 575.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	6.50259 AT (491119.30, 3720583.78, 432.83, 575.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	6.32416 AT (491082.78, 3720534.33, 430.28, 575.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	6.17968 AT (491028.00, 3720455.21, 432.49, 521.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.81315 AT (491046.26, 3720484.88, 431.10, 575.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	5.70071 AT (491101.04, 3720564.00, 431.53, 575.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	5.47366 AT (491064.52, 3720514.55, 430.02, 575.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	5.36867 AT (491009.74, 3720435.43, 432.99, 521.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	5.35858 AT (491101.04, 3720554.11, 430.93, 575.00, 0.00)	DC	
1B	1ST HIGHEST VALUE IS	10.41932 AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	10.26300 AT (491064.52, 3720504.66, 430.04, 575.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	9.84406 AT (491119.30, 3720583.78, 432.83, 575.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	9.27278 AT (491028.00, 3720455.21, 432.49, 521.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	9.24877 AT (491082.78, 3720534.33, 430.28, 575.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	8.49858 AT (491046.26, 3720484.88, 431.10, 575.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	8.34538 AT (491101.04, 3720564.00, 431.53, 575.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	7.84630 AT (491064.52, 3720514.55, 430.02, 575.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	7.81836 AT (491009.74, 3720435.43, 432.99, 521.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	7.75598 AT (491101.04, 3720554.11, 430.93, 575.00, 0.00)	DC	

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

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

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

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

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
1A HIGH 1ST HIGH VALUE IS	405.71762	ON 10122116:	AT (491119.30, 3720583.78, 432.83, 575.00, 0.00)	DC	
1B HIGH 1ST HIGH VALUE IS	763.15851	ON 10122116:	AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	

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

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

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

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
1A HIGH	1ST HIGH VALUE IS	115.92715m	ON 10122116:	AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	
1B HIGH	1ST HIGH VALUE IS	201.66174m	ON 10122116:	AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	

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

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

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

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
1A HIGH	1ST HIGH VALUE IS	35.28218m	ON 10122124: AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	
1B HIGH	1ST HIGH VALUE IS	61.37531m	ON 10122124: AT (491009.74, 3720425.54, 432.77, 521.00, 0.00)	DC	

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

Model Output
Unit Emission Rates (1 g/s)

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

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

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

A Total of   0 Fatal Error Message(s)
A Total of   0 Warning Message(s)
A Total of   1916 Informational Message(s)

A Total of   43848 Hours Were Processed

A Total of   10 Calm Hours Identified

A Total of   1906 Missing Hours Identified (4.35 Percent)

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

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

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

Appendix

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Appendix D. Risk Calculation Worksheets

Appendix

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Table D1
MER Concentration Worksheet
Toxic Air Contaminants - Mobile Sources

Source No. (a)	Source (b)	Contaminant (c)	Weight Fraction (d)	Emission Rates[1] **Annual Avg** (g/s) (e)	AERMOD Output[2] **Annual Avg** ($\mu g/m^3$) (f)	Annual Average MER Concentration ($\mu g/m^3$) (g)	Emission Rates[1] **1-Hour** (g/s) (h)	AERMOD Output[2] **1-Hour** ($\mu g/m^3$) (i)	Acute (1-Hour) MER Concentration ($\mu g/m^3$) (j)
Staff Scenario									
1	SR-79 Trucks (DPM)	Diesel Particulate	1.00E+00	1.01E-03	6.88	0.00697	n/a		
	SR-79 Cars (TOG)	Acetaldehyde	2.80E-03	1.53E-02	10.4	0.00045	1.44E-02	763.2	0.0308
		Acrolein	1.30E-03			0.00021			0.0143
		Benzene	2.83E-02			0.00450			0.3110
		1,3-Butadiene	5.50E-03			0.00087			0.0604
		Ethyl benzene	1.17E-02			0.00186			0.1286
		Formaldehyde	1.58E-02			0.00251			0.1736
		Hexane	3.14E-02			0.00499			0.3450
		Methanol	1.20E-03			0.00019			0.0132
		Methyl Ethyl Ketone	2.00E-04			0.00003			0.0022
		Naphthalene	5.00E-04			0.00008			0.0055
		Propylene	3.06E-02			0.00487			0.3362
		Styrene	1.20E-03			0.00019			0.0132
		Toluene	7.46E-02			0.01186			0.8197
		Xylenes	5.38E-02			0.00856			0.5912
Student Scenario									
1	SR-79 Trucks (DPM)	Diesel Particulate	1.00E+00	1.39E-03	6.88	0.00957	n/a		
	SR-79 Cars (TOG)	Acetaldehyde	2.80E-03	1.33E-02	10.4	0.00039	1.44E-02	763.2	0.0308
		Acrolein	1.30E-03			0.00018			0.0143
		Benzene	2.83E-02			0.00393			0.3110
		1,3-Butadiene	5.50E-03			0.00076			0.0604
		Ethylbenzene	1.17E-02			0.00162			0.1286
		Formaldehyde	1.58E-02			0.00219			0.1736
		Hexane	3.14E-02			0.00436			0.3450
		Methanol	1.20E-03			0.00017			0.0132
		Methyl Ethyl Ketone	2.00E-04			0.00003			0.0022
		Naphthalene	5.00E-04			0.00007			0.0055
		Propylene	3.06E-02			0.00425			0.3362
		Styrene	1.20E-03			0.00017			0.0132
		Toluene	7.46E-02			0.01035			0.8197
		Xylenes	5.38E-02			0.00747			0.5912
Note: Maximum Exposed Receptor (MER)						For Cancer/Chronic Calculation			For Acute Calculation

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

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

Table D2
HARP2 Results for Cancer Risk and Chronic Hazards
School Scenario

No.	Source	Contaminant	Carcinogenic Risks		Chronic Non-Cancer Risks [2] - Toxicological Endpoints*											
			Staff	**Students**	CV	CNS	IMMUN	KIDNEY	GILV	REPRO	**RESP**	SKIN	EYE	BONE	ENDO	BLOOD
			per million	per million												
(a)	(b)	(c)	(j)	(j)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	SR-79 Trucks (DPM)	Diesel Particulate	4.2E-01	1.0E+00							1.91E-03					
	SR-79 Cars (TOG)	Acetaldehyde	2.5E-04	3.9E-04							2.79E-06					
		Acrolein									5.14E-04					
		Benzene	2.5E-02	3.9E-02												1.31E-03
		1,3-Butadiene	3.0E-02	4.5E-02						3.80E-04						
		Ethylbenzene	9.1E-04	1.4E-03				8.10E-07	8.10E-07	8.10E-07					8.10E-07	
		Formaldehyde	3.0E-03	4.5E-03							2.43E-04					
		Hexane				6.23E-07										
		Methanol								4.25E-08						
		Methyl Ethyl Ketone														
		Naphthalene	5.4E-04	8.3E-04							7.78E-06					
		Propylene									1.42E-06					
		Styrene				1.89E-07										
		Toluene				3.45E-05				3.45E-05	3.45E-05					
		Xylenes				1.07E-05					1.07E-05		1.07E-05			
	Total - All Sources		**0.48**	**1.13**	0.00E+00	4.60E-05	0.00E+00	8.10E-07	8.10E-07	4.15E-04	**2.73E-03**	0.00E+00	1.07E-05	0.00E+00	8.10E-07	1.31E-03

Note: Health risks calculated using HARP2, Risk Assessment Standalone Tool, version 16057 (CARB, 2016).

Total Cancer Risk	**Staff**	**0.48**	per million
Total Cancer Risk	**Students**	**1.13**	per million
Maximum Chronic Hazard Index		**2.73E-03**	**RESP**

	Staff	Students	
	16 < 70 years	2 < 16 years	age bin
Dose Exposure Factors:	250	180	exposure frequency (days/year)
	230	520	8-hour inhalation rate (L/kg-8 hours) [1]
	1	1	inhalation absorption factor
Risk Calculation Factors:	1	3	age sensitivity factor
	25	9	exposure duration (years)
	70	70	averaging time (years)

* Key to Toxicological Endpoints

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

[1] 8-hour inhalation rate taken as the 95th percentile breathing rates for Moderate Intensity Activities (OEHHA, 2015).

[2] Student Scenario emission rates produced higher chronic hazard indices, compared to Staff Scenario emission rates.

Table D3
HARP2 Results for Acute Hazards

Source No.	Source	Contaminant	Acute Non-Cancer Risks - Toxicological Endpoints*											
			CV	CNS	IMMUN	KIDNEY	GILV	**REPRO**	RESP	SKIN	EYE	BONE	ENDO	BLOOD
(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	SR-79 Trucks (DPM)	Diesel Particulate												
	SR-79 Cars (TOG)	Acetaldehyde							6.55E-05		6.55E-05			
		Acrolein							5.71E-03		5.71E-03			
		Benzene			1.15E-02			1.15E-02						1.15E-02
		1,3-Butadiene						9.16E-05						
		Ethylbenzene												
		Formaldehyde									3.16E-03			
		Hexane												
		Methanol		4.71E-07										
		Methyl Ethyl Ketone							1.69E-07		1.69E-07			
		Naphthalene												
		Propylene												
		Styrene	6.28E-07					6.28E-07	6.28E-07		6.28E-07			
		Toluene		2.22E-05				2.22E-05	2.22E-05		2.22E-05			
		Xylenes		2.69E-05					2.69E-05		2.69E-05			
		Total - All Sources	6.28E-07	4.95E-05	1.15E-02	0.00E+00	0.00E+00	**1.16E-02**	5.83E-03	0.00E+00	8.99E-03	0.00E+00	0.00E+00	1.15E-02

Note: Student Scenario emission rates produced higher acute (1-hour) hazard indices, compared to Staff Scenario emission rates.

Note: Health risks calculated using HARP2, Risk Assessment Standalone Tool, version 16057 (CARB, 2016).

Maximum Acute Hazard Index 1.16E-02 Repro

* Key to Toxicological Endpoints

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

Table D4
HARP2 Results for 8-Hour Hazards

Source No.	Source	Contaminant	8-Hour Non-Cancer Risks - Toxicological Endpoints*										
			CV	CNS	IMMUN	KIDNEY	GILV	REPRO	RESP	SKIN	EYE	BONE	ENDO	**BLOOD**
(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	SR-79 Trucks (DPM)	Diesel Particulate												
	SR-79 Cars (TOG)	Acetaldehyde							1.48E-06					
		Acrolein							2.96E-04					
		Benzene												1.50E-03
		1,3-Butadiene						9.72E-05						
		Ethylbenzene												
		Formaldehyde							2.79E-04					
		Hexane												
		Methanol												
		Methyl Ethyl Ketone												
		Naphthalene												
		Propylene												
		Styrene												
		Toluene												
		Xylenes												
		Total - All Sources	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.72E-05	5.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.50E-03**

Note: Staff Scenario emission rates produced higher 8-hour chronic hazard indices, compared to Student Scenario emission rates.

Note: Health risks calculated using HARP2, Risk Assessment Standalone Tool, version 16057 (CARB, 2016).

Maximum 8-Hour Hazard Index 1.50E-03 Blood

* Key to Toxicological Endpoints

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

Table D5
Mobile Source Pollutant Concentration Worksheet
Criteria Air Pollutants

Criteria Air Pollutants						
Pollutant (a)	Source (b)	Emission Rates [1] (g/s) (c)	AERMOD Output [2] ($\mu g/m^3$) (d)	Mass GLC ($\mu g/m^3$) (e)	AERMOD Output [2] ($\mu g/m^3$) (f)	Mass GLC ($\mu g/m^3$) (g)
PM_{10}			Max 24-hour		Annual Average	
	SR-79	2.72E-02	61.4	**1.67**	10.4	**0.28**
	LST Threshold ($\mu g/m^3$)			2.50		1.00
	Exceeds Threshold?			**No**		**No**
$PM_{2.5}$			Max 24-hour			
	SR-79	6.38E-03	61.4	**0.39**		
	LST Threshold ($\mu g/m^3$)			2.50		
	Exceeds Threshold?			**No**		
CO			Max 1-hour		Max 8-hour	
	SR-79	3.88E-01	763.2	2.96E+02	201.7	7.82E+01
	SR-79 (ppm) [3]			**0.26**		**0.07**
	Background Level (ppm)			2.00		1.40
	Total (ppm)			**2.26**		**1.47**
	CAAQS Threshold (ppm)			20.0		9.0
	Exceeds Threshold?			**No**		**No**
NOx			Max 1-hour		Annual Average	
	SR-79	1.78E-01	763.2	1.36E+02	10.4	1.86E+00
	SR-79 (ppm) [4]			7.23E-02		9.87E-04
NO_2	SR-79 (ppm) [5]			3.83E-03		5.23E-05
	Background Level (ppm)			0.048		0.010
	Total (ppm)			**0.052**		**0.010**
	CAAQS Threshold (ppm)			0.18		0.030
	Exceeds Threshold?			**No**		**No**

[1] Emission Rates from Source Emissions Inventory (Appendix A).

[2] AERMOD Output based on unit emission rates for roadway segments (1 g/s).

[3] CO conversion factor of 8.733E-04 ppm per $\mu g/m^3$ was used to convert concentrations.

[4] NOx conversion factor of 5.3157E-04 ppm per $\mu g/m^3$ was used to convert concentrations.

[5] NOx to NO_2 conversion rate was derived from a report entitled Final Localized Significance Threshold Methodology (SCAQMD, 2008)

Mobile Source	Distance from Roadway to Project Site (m)	NO_X to NO_2 Conversion Factor
SR-79	18.5	0.053

Appendix

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Appendix B Air Quality and Greenhouse Gas Background and Modeling Data

Air Quality and Greenhouse Gas Background and Modeling Data

AIR QUALITY

Climate/Meteorology

SOUTH COAST AIR BASIN

The project site lies within the South Coast Air Basin (SoCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The SoCAB is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds (SCAQMD 2005).

Temperature and Precipitation

The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station nearest to the project site is the Elsinore, California Monitoring Station (ID No. 042805). The average low is reported at 36.4°F in January, and the average high is 98.1°F in July and August (WRCC 2016).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November through April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. The historical rainfall average for the project area is 12.01 inches per year (WRCC 2016).

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent. Low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SoCAB (SCAQMD 2005).

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions (SCAQMD 2005).

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These are the marine/subsidence inversion and the radiation inversion. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area (SCAQMD 2005).

Air Quality Regulations

The Proposed Project has the potential to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, it falls under the ambient air quality standards promulgated at the local, state, and federal levels. The project site is in the SoCAB and is subject to the rules and regulations imposed by the South Coast Air Quality Management District (SCAQMD). However, SCAQMD reports to California Air Resources board (CARB), and all criteria emissions are also governed by the California and national Ambient Air Quality Standards (AAQS). Federal, state, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the Proposed Project are summarized below.

AMBIENT AIR QUALITY STANDARDS

The Clean Air Act (CAA) was passed in 1963 by the US Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The CAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state

to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS, based on even greater health and welfare concerns.

These National AAQS and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect "sensitive receptors" most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both California and the federal government have established health-based AAQS for seven air pollutants. As shown in Table 1, *Ambient Air Quality Standards for Criteria Pollutants*, these pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Ozone (O_3)[3]	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.070 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	*	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm	
	24 hours	0.04 ppm	0.14 ppm	
Respirable Coarse Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 µg/m^3	150 µg/m^3	
Respirable Fine Particulate Matter ($PM_{2.5}$)[4]	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m^3	

Table 1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Lead (Pb)	30-Day Average	1.5 µg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	*	1.5 µg/m^3	
	Rolling 3-Month Average	*	0.15 µg/m^3	
Sulfates (SO_4)[5]	24 hours	25 µg/m^3	*	Industrial processes.
Visibility Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24 hour	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Source: CARB 2016a.

Notes: ppm: parts per million; µg/m^3: micrograms per cubic meter

* Standard has not been established for this pollutant/duration by this entity.

1 California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

3 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

4 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

5 On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

California has also adopted a host of other regulations that reduce criteria pollutant emissions, including:

- AB 1493: Pavley Fuel Efficiency Standards
- Title 20 California Code of Regulations (CCR): Appliance Energy Efficiency Standards
- Title 24, Part 6, CCR: Building and Energy Efficiency Standards
- Title 24, Part 11, CCR: Green Building Standards Code

CRITERIA AIR POLLUTANTS

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. Air pollutants are categorized as primary or secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), volatile organic compounds (VOC), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. Of these, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are "criteria air pollutants," which means that ambient air quality standards (AAQS) have been established for them. VOC and oxides of nitrogen (NO_x) are air pollutant precursors that form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and NO_2 are the principal secondary pollutants. A description of each of the primary and secondary criteria air pollutants and their known health effects is presented below.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion, engines and motor vehicles operating at slow speeds are the primary source of CO in the SoCAB. The highest ambient CO concentrations are generally found near traffic-congested corridors and intersections. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (SCAQMD 2005; USEPA 2015a). The SoCAB is designated under the California and National AAQS as being in attainment of CO criteria levels (CARB 2015a).

Volatile Organic Compounds (VOC) are compounds composed primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of VOCs include evaporative emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. There are no ambient air quality standards established for VOCs. However, because they contribute to the formation of ozone (O_3), SCAQMD has established a significance threshold for this pollutant (SCAQMD 2005).

Nitrogen Oxides (NO_x) are a byproduct of fuel combustion and contribute to the formation of O_3, PM_{10}, and $PM_{2.5}$. The two major forms of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2). The principal form of NO_2 produced by combustion is NO, but NO reacts with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in

children (two and three years old) has also been observed at concentrations below 0.3 part per million (ppm). NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure (SCAQMD 2005; USEPA 2015a). The SoCAB is designated as an attainment area for NO_2 under the National AAQS California AAQS (CARB 2015a).

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and from chemical processes at chemical plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2 (SCAQMD 2005; USEPA 2015a). When sulfur dioxide forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_X). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. At lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. The SoCAB is designated as attainment under the California and National AAQS (CARB 2015a).

Suspended Particulate Matter (PM_{10} and $PM_{2.5}$) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 millionths of a meter or 0.0004 inch) or less. Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns (i.e., 2.5 millionths of a meter or 0.0001 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind action on arid landscapes also contributes substantially to local particulate loading (i.e., fugitive dust). Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems (SCAQMD 2005).

The US Environmental Protection Agency's (EPA) scientific review concluded that $PM_{2.5}$, which penetrates deeply into the lungs, is more likely than PM_{10} to contribute to health effects and at concentrations that extend well below those allowed by the current PM_{10} standards. These health effects include premature death and increased hospital admissions and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individuals with cardiopulmonary disease such as asthma); decreased lung functions (particularly in children and individuals with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms (SCAQMD 2005). There has been emerging evidence that even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤ 0.1 millionths of a meter or <0.000004 inch), known as ultrafine particulates (UFPs), have human health implications, because UFPs toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs (SCAQMD 2013). However, the EPA or CARB have yet to adopt AAQS to regulate these particulates. Diesel particulate matter (DPM) is classified by the CARB as a carcinogen (CARB 1998). Particulate matter can also cause environmental effects such as visibility impairment,[1] environmental damage,[2] and aesthetic damage[3]

[1] $PM_{2.5}$ is the main cause of reduced visibility (haze) in parts of the United States.

(SCAQMD 2005; USEPA 2015a). The SoCAB is a nonattainment area for $PM_{2.5}$ under California and National AAQS and a nonattainment area for PM_{10} under the California AAQS (CARB 2015a).[4]

Ozone (O_3) is commonly referred to as "smog" and is a gas that is formed when VOCs and NO_x, both by-products of internal combustion engine exhaust, undergo photochemical reactions in the presence of sunlight. O_3 is a secondary criteria air pollutant. O_3 concentrations are generally highest during the summer months when direct sunlight, light winds, and warm temperatures create favorable conditions for the formation of this pollutant. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Breathing O_3 can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level O_3 also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. O_3 also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. In particular, O_3 harms sensitive vegetation during the growing season (SCAQMD 2005; USEPA 2015a). The SoCAB is designated as extreme nonattainment under the California AAQS (1-hour and 8-hour) and National AAQS (8-hour) (CARB 2015a).

Lead (Pb) concentrations decades ago exceeded the state and federal AAQS by a wide margin, but have not exceeded state or federal air quality standards at any regular monitoring station since 1982 (SCAQMD 2005). However, in 2008 the EPA and CARB adopted more strict lead standards, and special monitoring sites immediately downwind of lead sources[5] recorded every localized violations of the new state and federal standards. As a result of these localized violations, the Los Angeles County portion of the SoCAB was designated in 2010 as nonattainment under the National AAQS for lead (SCAQMD 2012; CARB 2015a). The project is not characteristic of industrial-type projects that have the potential to emit lead. Therefore, lead is not a pollutant of concern for the project.

TOXIC AIR CONTAMINANTS

The public's exposure to air pollutants classified as toxic air contaminants (TACs) is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The California Health and Safety Code defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant (HAP) pursuant to Section 112(b) of the federal Clean

[2] Particulate matter can be carried over long distances by wind and then settle on ground or water, making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.

[3] Particulate matter can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

[4] CARB approved the SCAQMD's request to redesignate the SoCAB from serious nonattainment for PM_{10} to attainment for PM_{10} under the National AAQS on March 25, 2010, because the SoCAB has not violated federal 24-hour PM_{10} standards during the period from 2004 to 2007. In June 2013, the EPA approved the State of California's request to redesignate the PM_{10} nonattainment area to attainment of the PM_{10} National AAQS, effective on July 26, 2013.

[5] Source-oriented monitors record concentrations of lead at lead-related industrial facilities in the SoCAB, which include Exide Technologies in the City of Commerce; Quemetco, Inc., in the City of Industry; Trojan Battery Company in Santa Fe Springs; and Exide Technologies in Vernon. Monitoring conducted between 2004 through 2007 identified that the Trojan Battery Company and Exide Technologies exceed the federal standards (SCAQMD 2012).

Air Act (42 United States Code §7412[b]) is a toxic air contaminant. Under state law, the California Environmental Protection Agency (Cal/EPA), acting through CARB, is authorized to identify a substance as a TAC if it determines that the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (i.e., a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions. To date, CARB has established formal control measures for 11 TACs, all of which are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987. Under AB 2588, toxic air contaminant emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

By the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

In 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as a TAC. Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

CARB has promulgated the following specific rules to limit TAC emissions:

- CARB Rule 2485 (13 CCR Chapter 10, Section 2485), Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- CARB Rule 2480 (13 CCR Chapter 10, Section 2480), Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- CARB Rule 2477 (13 CCR Section 2477 and Article 8), Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate

In addition, to reduce exposure to TACs, CARB developed and approved the *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) to provide guidance regarding the siting of sensitive land uses

in the vicinity of freeways, distribution centers, rail yards, ports, refineries, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities. This guidance document was developed to assess compatibility and associated health risks when placing sensitive receptors near existing pollution sources. CARB's recommendations on the siting of new sensitive land uses were based on a compilation of recent studies that evaluated data on the adverse health effects from proximity to air pollution sources. The key observation in these studies is that proximity to air pollution sources substantially increases exposure and the potential for adverse health effects. There are three carcinogenic toxic air contaminants that constitute the majority of the known health risks from motor vehicle traffic, DPM from trucks, and benzene and 1,3 butadiene from passenger vehicles. CARB recommendations are based on data that show that localized air pollution exposures can be reduced by as much as 80 percent by following CARB minimum distance separations.

Multiple Airborne Toxics Exposure Study (MATES)

The Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study on ambient concentrations of TACs and estimated the potential health risks from air toxics in the SoCAB. In 2008, SCAQMD conducted its third update to the MATES study (MATES III). The results showed that the overall risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for 84 percent of the cancer risk (SCAQMD 2008a).

SCAQMD recently released the fourth update (MATES IV). The results showed that the overall monitored risk for excess cancer from a lifetime exposure to ambient levels of air toxics decreased to approximately 418 in one million. Compared to the 2008 MATES III, monitored excess cancer risks decreased by approximately 65 percent. Approximately 90 percent of the risk is attributed to mobile sources while 10 percent is attributed to TACs from stationary sources, such as refineries, metal processing facilities, gas stations, and chrome plating facilities. The largest contributor to this risk was diesel exhaust, accounting for approximately 68 percent of the air toxics risk. Compared to MATES III, MATES IV found substantial improvement in air quality and associated decrease in air toxics exposure. As a result, the estimated basin-wide population-weighted risk decreased by approximately 57 percent compared to the analysis done for the MATES III time period (SCAQMD 2015a).

The Office of Environmental Health Hazard Assessment (OEHHA) updated the guidelines for estimating cancer risks on March 6, 2015. The new method utilizes higher estimates of cancer potency during early life exposures, which result in a higher calculation of risk. There are also differences in the assumptions on breathing rates and length of residential exposures. When combined together, SCAQMD estimates that risks for a given inhalation exposure level will be about 2.7 times higher using the proposed updated methods identified in MATES IV (e.g., 2.7 times higher than 418 in one million overall excess cancer risk) (SCAQMD 2015a).

Air Quality Management Planning

SCAQMD is the agency responsible for preparing the air quality management plan (AQMP) for the SoCAB in coordination with the Southern California Association of Governments (SCAG). Since 1979, a number of AQMPs have been prepared.

2012 AQMP

On December 7, 2012 SCAQMD adopted the 2012 AQMP (Plan), which employs the most up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. The Plan also addresses several state and federal planning requirements, incorporating new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and new meteorological air quality models. The Plan builds upon the approach identified in the 2007 AQMP for attainment of federal PM and ozone standards, and highlights the significant amount of reductions needed and the urgent need to engage in interagency coordinated planning to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria air pollutant standards within the timeframes allowed under the Federal CAA. The Plan demonstrates attainment of federal 24-hour $PM_{2.5}$ standard by 2014 and the federal 8-hour ozone standard by 2023. Preliminary ambient air quality data suggests that meeting the 2016 federal 24-hour $PM_{2.5}$ standards by the end of 2014 is not likely, largely due to the usually extreme drought conditions in the SoCAB (SCAQMD 2015b). The Plan includes an update to the revised EPA 8-hour ozone control plan with new commitments for short-term NO_X and VOC reductions. In addition, it also identifies emerging issues of ultrafine ($PM_{1.0}$) particulate matter and near-roadway exposure, and an analysis of energy supply and demand.

2016 Draft AQMP

The SCAQMD is in the process of updating the AQMP and released a draft of the 2016 AQMP on June 30, 2016. The 2016 AQMP addresses strategies and measures to attain the 2008 federal 8-hour ozone standard by 2031, the 2012 federal annual $PM_{2.5}$ standard by 2025, the 2006 federal 24-hour $PM_{2.5}$ standard by 2019, the 1997 federal 8-hour ozone standard by 2023, and the 1979 federal 1-hour ozone standard by year 2022. It is projected that total NO_X emissions in the SoCAB would need to be reduced to 150 tons per day (tpd) by year 2023 and to 100 tpd in year 2031 to meet the 1997 and 2008 federal 8-hour ozone standards. The strategy to meet the 1997 federal 8-hour ozone standard would also lead to attaining the 1979 federal 1-hour ozone standard by year 2022 (SCAQMD 2016a), which requires reducing NO_X emissions in the SoCAB to 250 tpd. Reducing NO_X emissions would also reduce $PM_{2.5}$ concentrations within the SoCAB. However, as the goal is to meet the 2012 federal annual $PM_{2.5}$ standard no later than year 2025, SCAQMD is seeking to reclassify the SoCAB from "moderate" to "serious" nonattainment under this federal standard. A "moderate" non-attainment would require meeting the 2012 federal standard by no later than 2021. Overall, the 2016 AQMP is composed of stationary and mobile-source emission reductions from regulatory control measures, incentive-based programs, co-benefits from climate programs, mobile-source strategies, and reductions from federal sources such as aircrafts, locomotives, and ocean-going vessels. Strategies outlined in the 2016 AQMP would be implemented in collaboration between CARB and the EPA (SCAQMD 2016a).

LEAD STATE IMPLEMENTATION PLAN

In 2008 EPA designated the Los Angeles County portion of the SoCAB nonattainment under the federal lead (Pb) classification due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in Vernon and the City of Industry exceeding the new standard. The rest of the SoCAB, outside the Los Angeles County nonattainment area remains in attainment of the new standard. On May 24, 2012, CARB approved the SIP revision for the federal lead standard, which the EPA revised in 2008. Lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011. The SIP revision was submitted to EPA for approval.

AREA DESIGNATIONS

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the State Implementation Plan (SIP). Areas are classified as attainment or nonattainment areas for particular pollutants, depending on whether they meet ambient air quality standards. Severity classifications for ozone nonattainment range in magnitude from marginal, moderate, and serious to severe and extreme.

- **Unclassified:** a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.

- **Attainment:** a pollutant is in attainment if the CAAQS for that pollutant was not violated at any site in the area during a three-year period.

- **Nonattainment:** a pollutant is in nonattainment if there was at least one violation of a state AAQS for that pollutant in the area.

- **Nonattainment/Transitional:** a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the AAQS for that pollutant.

The attainment status for the SoCAB is shown in Table 2, *Attainment Status of Criteria Pollutants in the South Coast Air Basin*. The SoCAB is designated in attainment of the California AAQS for sulfates. The SoCAB is designated as nonattainment for lead (Los Angeles County only) under the National AAQS.

Table 2 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Federal Standard
Ozone – 8-hour	Extreme Nonattainment	Extreme Nonattainment
PM_{10}	Serious Nonattainment	Attainment/Maintenance
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Nonattainment (Los Angeles County only)[1]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB 2015a.

[1] In 2010, the Los Angeles portion of the SoCAB was designated nonattainment for lead under the new federal and existing state AAQS as a result of large industrial emitters. Remaining areas within the SoCAB are unclassified.

Existing Ambient Air Quality

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site are best documented by measurements taken by the SCAQMD. The project site is located within Source Receptor Area (SRA) 26 – Temecula Valley. The air quality monitoring station closest to the project site is the Winchester-33700 Borel Road Monitoring Station. This station monitors O_3. Data for CO, NO_2, and PM_{10} is supplemented by Lake Elsinore-W Flint Street Monitoring Station. Data for $PM_{2.5}$ is supplemented by Riverside-Magnolia Monitoring Station. Data for SO_2 is supplemented by Riverside-Rubidoux Monitoring Station. The most current five years of data monitored at these monitoring stations are included in Table 3, *Ambient Air Quality Monitoring Summary*. The data show recurring violations of both the state and federal O_3 standards and occasional violations of the federal $PM_{2.5}$ standard. The CO, SO_2, NO_2, and PM_{10} standards have not been violated in the last five years.

Table 3 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels during Such Violations				
	2011	2012	2013	2014	2015
Ozone (O_3)[1]					
State 1-Hour ≥ 0.09 ppm (days exceed threshold)	1	1	0	1	1
State 8-hour ≥ 0.07 ppm (days exceed threshold)	27	21	12	14	23
Federal 8-Hour > 0.075 ppm (days exceed threshold)	14	4	3	4	6
Max. 1-Hour Conc. (ppm)	0.105	0.104	0.093	0.119	0.100
Max. 8-Hour Conc. (ppm)	0.089	0.083	0.079	0.100	0.087
Carbon Monoxide (CO)[2]					
State 8-Hour > 9.0 ppm (days exceed threshold)	0	0	0	*	*
Federal 8-Hour ≥ 9.0 ppm (days exceed threshold)	0	0	0	*	*
Max. 8-Hour Conc. (ppm)	0.67	0.52	*	*	*
Nitrogen Dioxide (NO_2)[2]					
State 1-Hour ≥ 0.18 ppm (days exceed threshold)	0	0	0	0	0
Federal 1-Hour ≥ 0.100 ppm (days exceed threshold)	0	0	0	0	0
Max. 1-Hour Conc. (ppb)	50	48	46	45	47
Sulfur Dioxide (SO_2)[4]					
State 24-Hour ≥ 0.04 ppm (days exceed threshold)	0	0	*	*	*
Federal 24-Hour ≥ 0.14 ppm (days exceed threshold)	0	0	*	*	*
Max 24-Hour Conc. (ppm)	0.001	0.001	*	*	*
Coarse Particulates (PM_{10})[2]					
State 24-Hour > 50 µg/m^3 (days exceed threshold)	0	0	0	0	0
Federal 24-Hour > 150 µg/m^3 (days exceed threshold)	*	*	*	*	*
Max. 24-Hour Conc. (µg/m^3)	99.8	65.5	112.3	86.8	90.7
Fine Particulates ($PM_{2.5}$)[3]					
Federal 24-Hour > 35 µg/m^3 (days exceed threshold)	2	0	1	0	*
Max. 24-Hour Conc. (µg/m^3)	51.6	30.2	53.7	30.9	*

Source: CARB 2016b.
ppm: parts per million; parts per billion, µg/m^3: micrograms per cubic meter
Notes: * Data not available.
[1] Data obtained from the Winchester-33700 Borel Road Monitoring Station.
[2] Data obtained from the Lake Elsinore-W Flint Street Monitoring Station.
[3] Data obtained from the Riverside-Magnolia Monitoring Station.
[4] Data obtained from the Riverside-Rubidoux Monitoring Station.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory

functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

Methodology

Projected construction-related air pollutant emissions are calculated using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2, distributed by the California Air Pollutant Control Officers Association (CAPCOA). CalEEMod compiles an emissions inventory of construction(fugitive dust, off-gas emissions, onroad emissions, and offroad emissions), area sources, indirect emissions from energy use, mobile sources, indirect emissions from waste disposal (annual only), and indirect emissions from water/wastewater (annual only) use. The calculated emissions of the project are compared to thresholds of significance for individual projects using the SCAQMD's CEQA Air Quality Analysis Guidance Handbook.

Thresholds of Significance

The analysis of the Proposed Project's air quality impacts follows the guidance and methodologies recommended in SCAQMD's *CEQA Air Quality Handbook* and the significance thresholds on SCAQMD's website.[6] CEQA allows the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. SCAQMD has established thresholds of significance for regional air quality emissions for construction activities and project operation. In addition to the daily thresholds listed above, projects are also subject to the AAQS. These are addressed though an analysis of localized CO impacts and localized significance thresholds (LSTs).

REGIONAL SIGNIFICANCE THRESHOLDS

SCAQMD has adopted regional construction and operational emissions thresholds to determine a project's cumulative impact on air quality in the SoCAB. Table 4, *SCAQMD Significance Thresholds*, lists SCAQMD's regional significance thresholds that are applicable for all projects uniformly regardless of size or scope. There is growing evidence that although ultrafine particulates contribute a very small portion of the overall atmospheric mass concentration, they represent a greater proportion of the health risk from PM. However, the EPA or CARB have not yet adopted AAQS to regulate ultrafine particulates; therefore, SCAQMD has not developed thresholds for them.

[6] SCAQMD's Air Quality Significance Thresholds are current as of March 2011 and can be found here: http://www.aqmd.gov/ceqa/hdbk.html.

Table 4 SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROGs)/ Volatile Organic Compounds (VOCs)	75 lbs/day	55 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day
Particulates ($PM_{2.5}$)	55 lbs/day	55 lbs/day

Source: SCAQMD 2015c.

Projects that exceed the regional significance threshold contribute to the nonattainment designation of the SoCAB. The attainment designations are based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health. Exposure to fine particulate pollution and ozone causes myriad health impacts, particularly to the respiratory and cardiovascular systems:

- Linked to increased cancer risk ($PM_{2.5}$, TACs)
- Aggravates respiratory disease (O_3, $PM_{2.5}$)
- Increases bronchitis (O_3, $PM_{2.5}$)
- Causes chest discomfort, throat irritation, and increased effort to take a deep breath (O_3)
- Reduces resistance to infections and increases fatigue (O_3)
- Reduces lung growth in children ($PM_{2.5}$)
- Contributes to heart disease and heart attacks ($PM_{2.5}$)
- Contributes to premature death (O_3, $PM_{2.5}$)
- Linked to lower birth weight in newborns ($PM_{2.5}$) (SCAQMD 2015d)

Exposure to fine particulates and ozone aggravates asthma attacks and can amplify other lung ailments such as emphysema and chronic obstructive pulmonary disease. Exposure to current levels of $PM_{2.5}$ is responsible for an estimated 4,300 cardiopulmonary-related deaths per year in the SoCAB. In addition, University of Southern California scientists responsible for a landmark children's health study found that lung growth improved as air pollution declined for children aged 11 to 15 in five communities in the SoCAB (SCAQMD 2015e).

Mass emissions in Table 4 are not correlated with concentrations of air pollutants but contribute to the cumulative air quality impacts in the SoCAB. Therefore, regional emissions from a single project do not single-handedly trigger a regional health impact. SCAQMD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality in the SoCAB. To achieve the health-based standards established by the EPA, SCAQMD prepares an AQMP that details regional programs to attain the AAQS.

CO HOTSPOTS

Areas of vehicle congestion have the potential to create pockets of CO called hot spots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hot spots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds. Typically, for an intersection to exhibit a significant CO concentration, it would operate at level of service (LOS) E or worse without improvements (Caltrans 1997). However, at the time of the 1993 Handbook, the SoCAB was designated nonattainment under the California AAQS and National AAQS for CO.

With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SoCAB and in the state have steadily declined. In 2007, the SoCAB was designated in attainment for CO under both the California AAQS and National AAQS. The CO hot spot analysis conducted for the attainment by SCAQMD for busiest intersections in Los Angeles during the peak morning and afternoon periods plan did not predict a violation of CO standards. [7] As identified in SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SoCAB in previous years, prior to redesignation, were a result of unusual meteorological and topographical conditions and not a result of congestion at a particular intersection. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (BAAQMD 2011).

LOCALIZED SIGNIFICANCE THRESHOLDS

SCAQMD developed LSTs for emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at the project site (offsite mobile-source emissions are not included in the LST analysis). LSTs represent the maximum emissions at a project site that are not expected to cause or contribute to an exceedance of the most stringent federal or state AAQS and are shown in Table 5, *SCAQMD Localized Significance Thresholds*.

[7] The four intersections were: Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles per day with LOS E in the morning peak hour and LOS F in the evening peak hour.

Table 5 SCAQMD Localized Significance Thresholds

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO_2 Standard (CAAQS)	0.18 ppm
Annual NO_2 Standard (CAAQS)	0.03 ppm
24-Hour PM_{10} Standard – Construction (SCAQMD)[1]	10.4 µg/m^3
24-Hour $PM_{2.5}$ Standard – Construction (SCAQMD)[1]	10.4 µg/m^3
24-Hour PM_{10} Standard – Operation (SCAQMD)[1]	2.5 µg/m^3
24-Hour $PM_{2.5}$ Standard – Operation (SCAQMD)[1]	2.5 µg/m^3

Source: SCAQMD 2015c.
ppm – parts per million; µg/m^3 – micrograms per cubic meter
[1] Threshold is based on SCAQMD Rule 403. Since the SoCAB is in nonattainment for PM_{10} and $PM_{2.5}$, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

To assist lead agencies, SCAQMD developed screening-level LSTs to back-calculate the mass amount (lbs. per day) of emissions generated onsite that would trigger the levels shown in Table 5 for projects under 5-acres. These "screening-level" LSTs tables are the localized significance thresholds for all projects of five acres and less; however, it can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required to compare concentrations of air pollutants generated by the project to the localized concentrations shown in Table 5.

LST analysis for construction is applicable to all projects of five acres and less; however, it can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required. In accordance with SCAQMD's LST methodology, construction LSTs are based on the acreage disturbed per day based on equipment use. The construction LSTs for the project site in SRA 26 are shown in Table 6, *SCAQMD Screening-Level Construction Localized Significance Thresholds,* for receptors within 150 feet (46 meters).

Table 6 SCAQMD Construction Localized Significance Thresholds

	Threshold (lbs/day)[1]			
Acreage Disturbed	Nitrogen Oxides (NO_X)	Carbon Monoxide (CO)	Coarse Particulates (PM_{10})	Fine Particulates ($PM_{2.5}$)
≤1.00 Acre Disturbed Per Day	196	1,044	10.63	3.83
1.31 Acres Disturbed Per Day	218	1,184	12.86	4.40
1.81 Acres Disturbed Per Day	254	1,407	16.43	5.31
3.50 Acres Disturbed Per Day	338	2,038	26.58	7.66
4.00 Acres Disturbed Per Day	362	2,221	29.51	8.32

Source: SCAQMD 2008a, Based on receptors in SRA 26.
[1] LSTs are based on receptors within 150 feet (46 meters).

Because the project is not an industrial project that has the potential to emit substantial sources of stationary emissions, operational LSTs are not an air quality impact of concern associated with the project. The operational LSTs in SRA 26 are shown in Table 7, *SCAQMD Screening-Level Operational Localized Significance Thresholds*.

Table 7 SCAQMD Screening-Level Operational Localized Significance Thresholds

Air Pollutant	Threshold (lbs/day) Operational[1]
Nitrogen Oxides (NO_X)	408
Carbon Monoxide (CO)	2,586
Coarse Particulates (PM_{10})	8.97
Fine Particulates ($PM_{2.5}$)	2.83

Source: SCAQMD 2008a, Based on receptors in SRA 26.
[1] LSTs are based on receptors within 150 feet (46 meters) for a project site size of five acre.

HEALTH RISK THRESHOLDS

Whenever a project would require use of chemical compounds that have been identified in SCAQMD Rule 1401, placed on CARB's air toxics list pursuant to AB 1807, or placed on the EPA's National Emissions Standards for Hazardous Air Pollutants, a health risk assessment is required by the SCAQMD. Table 8, *Toxic Air Contaminants Incremental Risk Thresholds*, lists the TAC incremental risk thresholds for operation of a project. The purpose of this environmental evaluation is to identify the significant effects of the Proposed Project on the environment, not the significant effects of the environment on the Proposed Project. (*California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal.4th 369 (Case No. S213478)*). CEQA does not require CEQA-level environmental document to analyze the environmental effects of attracting development and people to an area. However, the environmental document must analyze the impacts of environmental hazards on future users, when a proposed project exacerbates an existing environmental hazard or condition. Residential, commercial, and office uses do not use substantial quantities of TACs and typically do not exacerbate existing hazards, so these thresholds are typically applied to new industrial projects.

Table 8 SCAQMD Toxic Air Contaminants Incremental Risk Thresholds

Maximum Incremental Cancer Risk	≥ 10 in 1 million
Hazard Index (project increment)	≥ 1.0
Cancer Burden in areas ≥ 1 in 1 million	> 0.5 excess cancer cases

Source: SCAQMD 2015c.

GREENHOUSE GAS EMISSIONS

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. Climate change is the variation of Earth's climate over time, whether due to natural variability or as a result of human activities. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHG—water vapor,[8] carbon (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. Other GHG identified by the IPCC that contribute to global warming to a lesser extent include nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001).[9] The major GHG are briefly described below.

- **Carbon dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g. manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal landfills and water treatment facilities.

- **Nitrous oxide (N_2O)** is emitted during agricultural and industrial activities as well as during combustion of fossil fuels and solid waste.

- **Fluorinated gases** are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high global-warming-potential (GWP) gases.

    - ***Chlorofluorocarbons (CFCs***) are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone-

[8] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant, but part of the feedback loop o rather than a primary cause of change.

[9] Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (CARB 2014). However, state and national GHG inventories do not yet include black carbon due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

- ***Perfluorocarbons (PFCs)*** are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.

- ***Sulfur Hexafluoride (SF6)*** is a colorless gas soluble in alcohol and ether, slightly soluble in water. SF_6 is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.

- ***Hydrochlorofluorocarbons (HCFCs)*** contain hydrogen, fluorine, chlorine, and carbon atoms. Although ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also GHGs.

- ***Hydrofluorocarbons (HFCs)*** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs (IPCC 2001; USEPA 2015b).

GHGs are dependent on the lifetime or persistence of the gas molecule in the atmosphere. Some GHGs have stronger greenhouse effects than others. These are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 9, *GHG Emissions and Their Relative Global Warming Potential Compared to CO_2*. The GWP is used to convert GHGs to CO_2-equivalence (CO_2e) to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For example, under IPCC's Second Assessment Report GWP values for CH_4, a project that generates 10 metric tons (MT) of CH_4 would be equivalent to 210 MT of CO_2.[10]

[10] CO_2-equivalence is used to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

Table 9 GHG Emissions and Their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	50 to 200	1	1
Methane[2] (CH_4)	12 (±3)	12	21	25
Nitrous Oxide (N_2O)	120	114	310	298
Hydrofluorocarbons:				
HFC-23	264	270	11,700	14,800
HFC-32	5.6	4.9	650	675
HFC-125	32.6	29	2,800	3,500
HFC-134a	14.6	14	1,300	1,430
HFC-143a	48.3	52	3,800	4,470
HFC-152a	1.5	1.4	140	124
HFC-227ea	36.5	34.2	2,900	3,220
HFC-236fa	209	240	6,300	9,810
HFC-4310mee	17.1	15.9	1,300	1,030
Perfluoromethane: CF_4	50,000	50,000	6,500	7,390
Perfluoroethane: C_2F_6	10,000	10,000	9,200	12,200
Perfluorobutane: C_4F_{10}	2,600	NA	7,000	8,860
Perfluoro-2-methylpentane: C_6F_{14}	3,200	NA	7,400	9,300
Sulfur Hexafluoride (SF_6)	3,200	NA	23,900	22,800

Source: IPCC 1995; IPCC 2007.

Notes: The IPCC has published updated global warming potential (GWP) values in its Fifth Assessment Report (2013) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2 (radiative forcing is the difference of energy from sunlight received by the earth and radiated back into space). However, GWP values identified in the Second Assessment Report are still used by SCAQMD to maintain consistency in GHG emissions modeling. In addition, the 2008 Scoping Plan was based on the GWP values in the Second Assessment Report.

1 Based on 100-year time horizon of the GWP of the air pollutant relative to CO_2.

2 The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Regulatory Settings

REGULATION OF GHG EMISSIONS ON A NATIONAL LEVEL

The U.S. Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements, but allow the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation (USEPA 2009).

The EPA's endangerment finding covers emissions of six key GHGs—CO_2, CH_4, N_2O, hydro fluorocarbons, per fluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world (the first three are applicable to the Proposed Project).

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 metric tons (MT) or more of CO_2 per year are required to submit an annual report.

US Mandatory Report Rule for GHGs (2009)

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 MT or more of CO_2 per year are required to submit an annual report.

Update to Corporate Average Fuel Economy Standards (2010/2012)

The current Corporate Average Fuel Economy (CAFE) standards (for model years 2011 to 2016) incorporate stricter fuel economy requirements promulgated by the federal government and California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 (resulting in a fleet average of 35.5 miles per gallon [mpg] by 2016). Rulemaking to adopt these new standards was completed in 2010. California agreed to allow automakers who show compliance with the national program to also be deemed in compliance with state requirements. The federal government issued new standards in 2012 for model years 2017–2025, which will require a fleet average of 54.5 mpg in 2025.

EPA Regulation of Stationary Sources under the Clean Air Act (Ongoing)

Pursuant to its authority under the CAA, the EPA has been developing regulations for new stationary sources such as power plants, refineries, and other large sources of emissions. Pursuant to the President's 2013 Climate Action Plan, the EPA will be directed to also develop regulations for existing stationary sources.

REGULATION OF GHG EMISSIONS ON A STATE LEVEL

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Executive Order S-3-05, Executive Order B-30-15, Assembly Bill 32, Senate Bill 32, and Senate Bill 375.

Executive Order S-3-05

Executive Order S-3-05, signed June 1, 2005. Executive Order S-3-05 set the following GHG reduction targets for the State:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

Assembly Bill 32

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Assembly Bill 32 (AB 32), the Global Warming Solutions Act. AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-3-05.

CARB 2008 Scoping Plan

The final Scoping Plan was adopted by CARB on December 11, 2008. AB 32 directed CARB to adopt discrete early action measures to reduce GHG emissions and outline additional reduction measures to meet the 2020 target. In order to effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 MT of CO_2e per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012.

The 2008 Scoping Plan identified that GHG emissions in California are anticipated to be approximately 596 $MMTCO_2e$ in 2020. In December 2007, CARB approved a 2020 emissions limit of 427 $MMTCO_2e$ (471 million tons) for the state. The 2020 target requires a total emissions reduction of 169 $MMTCO_2e$, 28.5 percent from the projected emissions of the business-as-usual (BAU) scenario for the year 2020 (i.e., 28.5 percent of 596 $MMTCO_2e$) (CARB 2008).[11]

Key elements of CARB's GHG reduction plan that may be applicable to the project include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards (adopted and cycle updates in progress).
- Achieving a mix of 33 percent for energy generation from renewable sources (anticipated by 2020).
- A California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system for large stationary sources (adopted 2011). The cap-and-trade program was expanded in 2013 to include the electricity sector, and then again in 2015 to include fuels (including natural gas and gasoline).
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets (several Sustainable Communities Strategies have been adopted).

[11] CARB defines BAU in its Scoping Plan as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. Projections for each emission-generating sector were compiled and used to estimate emissions for 2020 based on 2002–2004 emissions intensities. Under CARB's definition of BAU, new growth is assumed to have the same carbon intensities as was typical from 2002 through 2004.

- Adopting and implementing measures pursuant to state laws and policies, including California's clean car standards (amendments to the Pavley Standards adopted 2009; Advanced Clean Car standard adopted 2012), goods movement measures, and the Low Carbon Fuel Standard (LCFS) (adopted 2009).

- Creating target fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation (in progress).

Table 10, *Scoping Plan Greenhouse Gas Reduction Measures and Reductions Toward 2020 Target,* shows the proposed reductions from regulations and programs outlined in the 2008 Scoping Plan. In recognition of the critical role that local governments play in the successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of today's levels by 2020 to ensure that municipal and community-wide emissions match the state's reduction target.[12] Measures that local governments take to support shifts in land use patterns are anticipated to emphasize compact, low-impact growth over development in greenfields, resulting in fewer VMT (CARB 2008).

[12] The Scoping Plan references a goal for local governments to reduce community GHG emissions by 15 percent from current (interpreted as 2008) levels by 2020, but it does not rely on local GHG reduction targets established by local governments to meet the state's GHG reduction target of AB 32.

Table 10 Scoping Plan Greenhouse Gas Reduction Measures and Reductions Toward 2020 Target

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO_{2e}	Percentage of Statewide 2020 Target
Cap and Trade Program and Associated Measures		
California Light-Duty Vehicle GHG Standards	31.7	19%
Energy Efficiency	26.3	16%
Renewable Portfolio Standard (33 percent by 2020)	21.3	13%
Low Carbon Fuel Standard	15	9%
Regional Transportation-Related GHG Targets[1]	5	3%
Vehicle Efficiency Measures	4.5	3%
Goods Movement	3.7	2%
Million Solar Roofs	2.1	1%
Medium/Heavy Duty Vehicles	1.4	1%
High Speed Rail	1.0	1%
Industrial Measures	0.3	0%
Additional Reduction Necessary to Achieve Cap	34.4	20%
Total Cap and Trade Program Reductions	**146.7**	**87%**
Uncapped Sources/Sectors Measures		
High Global Warming Potential Gas Measures	20.2	12%
Sustainable Forests	5	3%
Industrial Measures (for sources not covered under cap and trade program)	1.1	1%
Recycling and Waste (landfill methane capture)	1	1%
Total Uncapped Sources/Sectors Reductions	**27.3**	**16%**
Total Reductions Counted toward 2020 Target	**174**	**100%**
Other Recommended Measures – Not Counted toward 2020 Target		
State Government Operations	1.0 to 2.0	1%
Local Government Operations[2]	To Be Determined[2]	NA
Green Buildings	26	15%
Recycling and Waste	9	5%
Water Sector Measures	4.8	3%
Methane Capture at Large Dairies	1	1%
Total Other Recommended Measures – Not Counted toward 2020 Target	**42.8**	**NA**

Source: CARB 2008. Note: the percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 $MMTCO_{2e}$ and the Scoping Plan identifies 174 $MMTCO_{2e}$ of emissions reductions strategies.

$MMTCO_{2e}$: million metric tons of CO_{2e}

1 Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. A discussion of the regional targets for the Southern California Region and local land use changes recommended within the Southern California Association of Government's (SCAG) Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS) are included later in this section.

2 According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO_{2e} (or approximately 1.2 percent of the GHG reduction target). However, these reductions were not included in the Scoping Plan reductions to achieve the 2020 target.

2014 (First) Scoping Plan Update

CARB recently completed a five-year update to the 2008 Scoping Plan, as required by AB 32. The final Update to the Scoping Plan was released in May, and CARB adopted it at the May 22, 2014, board hearing. The Update to the Scoping Plan defines CARB's climate change priorities for the next five years and lays the

groundwork to reach post-2020 goals in Executive Orders S-3-05 and B-16-2012. The update includes the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants. The GHG target identified in the 2008 Scoping Plan is based on IPCC's GWPs identified in the Second and Third Assessment Reports (see Table 9). IPCC's Fourth and Fifth Assessment Reports identified more recent GWP values based on the latest available science. CARB recalculated the 1990 GHG emission levels with the updated GWPs in the Fourth Assessment Report, and the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, is slightly higher, at 431 $MMTCO_2e$ (CARB 2014).

The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As identified in the Update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the Update to the Scoping Plan also addresses the state's longer-term GHG goals within a post-2020 element. The post-2020 element provides a high level view of a long-term strategy for meeting the 2050 GHG goals, including a recommendation for the state to adopt a mid-term target. According to the Update to the Scoping Plan, local government reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals (CARB 2014).

According to the Update to the Scoping Plan, reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant acceleration of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit (CARB 2014).

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the State and requires state agencies to implement measures to meet the interim 2030 goal of Executive Order B-30-15 as well as the long-term goal for 2050 in Executive Order S-3-05. It also requires the Natural Resources Agency to conduct triennial updates the California adaption strategy, Safeguarding California, in order to ensure climate change is accounted for in State planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed Senate Bill 32 and Assembly Bill 197 into law, making the Executive Order goal for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires the CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

2030 Target Scoping Plan

The new Executive Order B-30-15 requires CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. The second Scoping Plan will address the new 2030 interim target to achieve a

40 percent reduction below 1990 levels by 2030. CARB released *the 2030 Target Scoping Plan Update Concept Paper* in June 2016 that identifies potential scenarios focusing on different emissions sectors with and without the Cap-and-Trade program, which is currently in litigation (CARB 2016c). Under AB 197, CARB is directed to prioritize direct emissions control strategies, which would emphasize implementing direct emissions reductions from large stationary source emitters such as power plants and refineries and also from mobile sources. Release of the second Scoping Plan Update that carries through the potential regulations and programs to achieve the 2040 target is anticipated in 2017.

Senate Bill 1383

On September 19, 2016, the Governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH_4. Black carbon is the light-absorbing component of fine particulate matter (PM) produced during incomplete combustion of fuels. SB 1383 requires the state board, no later than January 1, 2018, to approve and begin implementing that comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030, as specified. The bill also establishes targets for reducing organic waste in landfill. In April 2016, CARB adopted the *Proposed Short-Lived Climate Pollutant Strategy*, which identifies the state's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s, despite the tripling of diesel fuel use (CARB 2016d). In-use on-road rules are expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020. SCAQMD is one of the air districts that requires air pollution control technologies for chain-driven broilers, which reduces particulate emissions from these charbroilers by over 80 percent (CARB 2016d). Additionally, SCAQMD Rule 445, wood-burning devices limits installation of new fireplaces in the SoCAB.

SB 375 – Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS)

In 2008, Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPOs). Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial.

Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035 (CARB 2010). SB 375 requires CARB to periodically

update the targets, no later than every 8 years. CARB plans to propose updated targets for consideration in 2016, with the intent to make them effective in 2018. Sustainable communities strategies (SCSs) adopted in 2018 would be subject to the updated targets (CARB 2015b).

The 2020 targets are smaller than the 2035 targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 $MMTCO_2e$ of reductions by 2020 and 15 $MMTCO_2e$ of reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

CARB is currently in the process of updating the next round of targets and methodology to comply with the requirement for updates every eight years. Considerations for the next round of targets include whether to change the nature or magnitude of the emissions reduction targets for each of the MPOs, and whether the target-setting methodology should account for advances in technologies that reduce emissions. Such changes in methodology would permit cities to account for emissions reductions from advances in cleaner fuels and vehicles and not only from land use and transportation planning strategies.

SCAG's 2016-2040 RTP/SCS

SB 375 requires the MPOs to prepare a sustainable communities strategy in their regional transportation plan. For the SCAG region, the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) was adopted on April 7, 2016 (SCAG 2016) and is an update to the 2012 RTP/SCS. In general, the SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light duty trucks and thereby reduce GHG emissions from these sources.

The 2016-2040 RTP/SCS projects that the SCAG region will meet or exceed the passenger per capita targets set in 2010 by CARB. It is projected that VMT per capita in the region for year 2040 would be reduced by 7.4 percent with implementation of the 2016-2040 RTP/SCS compared to a no-plan year 2040 scenario. Under the 2016-2040 RTP/SCS, SCAG anticipates lowering GHG emissions 8 percent below 2005 levels by 2020, 18 percent by 2035, and 21 percent by 2040. The 18 percent reduction by 2035 over 2005 levels represents a 2 percent increase in reduction compared to the 2012 RTP/SCS projection. Overall, the SCS is meant to provide growth strategies that will achieve the aforementioned regional GHG emissions reduction targets. Land use strategies to achieve the region's targets include planning for new growth around High Quality Transit Areas and Livable Corridors, and creating Neighborhood Mobility Areas to integrate land use and transportation and plan for more active lifestyles (SCAG 2016). However, the SCS does not require that local general plans, specific plans, or zoning be consistent with SCS; instead, it provides incentives to governments and developers for consistency.

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the CAFE standards under *Federal Laws*, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

Executive Order S-1-07

On January 18, 2007, the state set a new low carbon fuel standard (LCFS) for transportation fuels sold within the state. Executive Order S-1-07 sets a declining standard for GHG emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels, and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

Executive Order B-16-2012

On March 23, 2012, the state identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate zero-emissions vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directs the number of zero-emission vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are zero-emission by 2015 and at least 25 percent by 2020. The executive order also establishes a target for the transportation sector of reducing GHG emissions from the transportation sector 80 percent below 1990 levels.

Senate Bills 1078, 107, and 350 and Executive Order S-14-08

A major component of California's Renewable Energy Program is the renewable portfolio standard (RPS) established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. CARB has now approved an even higher goal of 33 percent by 2020. In 2011, the state legislature adopted this higher standard in SBX1-2. Executive Order S-14-08 was signed in November 2008, which expands the state's Renewable Energy Standard to

33 percent renewable power by 2020. Senate Bill 350 (de Leon), signed into law September 2015, establishes tiered increases to the RPS of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030.[13] Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects because electricity production from renewable sources is generally considered carbon neutral.

SENATE BILL 350

Senate Bill 350 (de Leon), was signed into law September 2015. SB 350 establishes tiered increases to the RPS of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

California Building Standards Code – Building Energy Efficiency Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2013 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. On May 31, 2012, the CEC adopted the 2013 Building Energy Efficiency Standards, which went into effect July 1, 2014. Buildings that are constructed in accordance with the 2013 Building Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses.

Most recently, the CEC adopted the 2016 Building Energy Efficiency Standards. The 2016 Standards will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. These standards will go into effect on January 1, 2017. Under the 2016 Standards, residential buildings are 28 percent more energy efficient than the 2013 Standards while non-residential buildings are 5 percent more energy efficient than the 2013 Standards (CEC 2015a).

The 2016 standards will not get us to zero net energy (ZNE). However, they do get us very close to the State's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve ZNE for newly constructed residential buildings throughout California (CEC 2015b).

California Green Building Standards Code – CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24, known as "CALGreen") was adopted as part of the California Building Standards Code (Title 24, CCR). CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.[14] The

[13] SB 350 also sets a goal of increasing energy efficiency in existing buildings by 50 percent by 2030.
[14] The green building standards became mandatory in the 2010 edition of the code.

mandatory provisions of the California Green Building Code Standards became effective January 1, 2011 and were updated most recently in 2013. The building efficiency standards are enforced through the local building permit process.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non-federally regulated appliances. Though these regulations are now often viewed as "business-as-usual," they exceed the standards imposed by all other states and they reduce GHG emissions by reducing energy demand.

Solid Waste Regulations

California's Integrated Waste Management Act of 1989 (AB 939, Public Resources Code 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses.

The California Solid Waste Reuse and Recycling Access Act (AB 1327, California Public Resources Code §§ 42900 et seq.) requires areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

Section 5.408 of the 2013 California Green Building Standards Code also requires that at least 50 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

In October of 2014 Governor Brown signed AB 1826 requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

Water Efficiency Regulations

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and

therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 requires urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

The Water Conservation in Landscaping Act of 2006 (AB 1881) requires local agencies to adopt the updated DWR model ordinance or equivalent. AB 1881 also requires the Energy Commission, in consultation with the department, to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

REGULATION OF GHG EMISSIONS ON A COUNTY LEVEL

County of Riverside Climate Action Plan

The County of Riverside adopted Climate Action Plan (CAP) in December of 2015. The CAP addresses the County's goal to reduce emissions attributable to Riverside County to levels consistent with the target reductions of AB 32. The purpose of the CAP is to: 1) create a GHG emissions baseline from which to benchmark GHG reductions; 2) provide a plan that is consistent with and complementary to: the GHG emissions reduction efforts being conducted by the State of California through AB 32, federal government through the actions of the EPA, and the global community through the Kyoto Protocol; 3) guide the development, enhancement, and implementation of actions that reduce GHG emissions; and 4) provide a policy document with specific implementation measures meant to be considered as part of the planning process for future development projects. The CAP provides a list of specific actions that will reduce GHG emissions, giving the highest priority to actions that provide the greatest reduction in GHG emissions and benefits to the community at the least cost. The CAP also establishes a qualified reduction plan for which future development within Riverside County can tier and thereby streamline the environmental analysis necessary under CEQA.

The CAP's Appendix F indicates that the development review process procedures for evaluating GHG impacts and determining significance for CEQA purposes will be streamlined by: 1) applying an emissions level that is determined to be less than significant for small projects, and 2) utilizing the Screening Tables to mitigate project GHG emissions that exceed the threshold level. A threshold level above 3,000 $MTCO_2e$ per year will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions. Projects that garner at least 100 points from the Screening Tables will be consistent with the reduction quantities anticipated in the County's GHG Technical Report and would not require quantification of project specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions. Those projects that do not garnish 100 points using the Screening Table will need to provide additional analysis to determine the significance of GHG emissions (Riverside County 2015). Development projects are required to conduct a consistency evaluation with the CAP since the CAP represents the County's plan to reduce GHG emissions consistent with the statewide GHG emissions goals of AB 32.

Thresholds of Significance

The CEQA Guidelines recommend that a lead agency consider the following when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase (or reduce) GHG emissions as compared to the existing environmental setting;

2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;

3. The extent to which the project complies with regulations or requirements adopted to implement an adopted statewide, regional, or local plan for the reduction or mitigation of GHG emissions.[15]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD has convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting (Meeting No. 15) held in September 2010, SCAQMD is proposing to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency (SCAQMD 2010):

- **Tier 1.** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2.** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD is proposing a screening-level threshold of 3,000 $MTCO_2e$ annually for all land use types or the following land-use-specific thresholds: 1,400 $MTCO_2e$ for commercial projects, 3,500 $MTCO_2e$ for residential projects, or 3,000 $MTCO_2e$ for mixed-use projects. These bright-line thresholds are based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-

[15] The Governor's Office of Planning and Research recommendations include a requirement that such a plan must be adopted through a public review process and include specific requirements that reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions:

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted.

The SCAQMD Working Group has identified an efficiency target for projects that exceed the screening threshold of 4.8 $MTCO_2e$ per year per service population ($MTCO_2e$/year/SP) for project-level analyses and 6.6 $MTCO_2e$/year/SP for plan level projects (e.g., program-level projects such as general plans) for the year 2020.[16] The per capita efficiency targets are based on the AB 32 GHG reduction target and 2020 GHG emissions inventory prepared for CARB's 2008 Scoping Plan.[17]

For the purpose of this project, SCAQMD's project-level thresholds of 3,000 $MTCO_2e$ and 4.8 $MTCO_2e$/year/SP are used. If projects exceed the bright line and per capita efficiency targets, GHG emissions would be considered potentially significant in the absence of mitigation measures.

Life cycle emissions are not included in this analysis because not enough information is available for the proposed project, and therefore life cycle GHG emissions would be speculative.[18] Black carbon emissions are not included in the GHG analysis because CARB does not include this pollutant in the state's AB 32 inventory and treats this short-lived climate pollutant separately.[19]

[16] It should be noted that the Working Group also considered efficiency targets for 2035 for the first time in this Working Group meeting.

[17] SCAQMD took the 2020 statewide GHG reduction target for land use only GHG emissions sectors and divided it by the 2020 statewide employment for the land use sectors to derive a per capita GHG efficiency metric that coincides with the GHG reduction targets of AB 32 for year 2020.

[18] Life cycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (see Final Statement of Reasons for Regulatory Action, December 2009). Because the amount of materials consumed during the operation or construction of the proposed project is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted (OPR 2008).

[19] Particulate matter emissions, which include black carbon, are analyzed in Section 5.2, *Air Quality*. Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The State's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years (CARB 2016c).

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Appendix

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Appendix C1 Habitat Assessment

Habitat Assessment
Temecula Valley Charter School
APNs 476-010-059, 476-010-013, 476-010-054
Winchester, Riverside County, California

Received on:
May 25, 2017

Prepared For:

Mr. Dwayne Mears
PlaceWorks
3 MacArthur Place, Suite 1100
Santa Ana, CA 92707

Prepared By:

Phillip Brylski, Ph.D
61 Acacia Tree Lane
Irvine, California 92612

and

David Bramlet
Consulting Biologist
1691 Mesa Dr. No. A-2
Newport Beach CA 92660

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Appendices

1. INTRODUCTION

This report describes the biological resources of the proposed Temecula Valley Charter School site and examines the proposed project's consistency with the Riverside County Multi-Species Habitat Conservation Plan. The proposed school site examined consists of two parcels (APNs 476-010-059 and 476-010-013) and a new access road (the Flossie Way Right-Of-Way, ROW) in the Winchester area of unincorporated Riverside County. The areas of the two parcels are 7.40 and 7.10 acres; the Row of the Flossie Way access road covers 1.78 acres, for a total project area of 16.27acres. These acreages are based on GIS analysis of the parcels, and differ somewhat from parcel acreages in the County website. The street address of the site is 34155 Winchester Road (Highway 79), approximately 630 ft. south of Keller Road. The project site includes an access road along an existing easement for the future development of Flossie Way. This easement is located in the northern area of APN 476-010-054 and would comprise approximately 1.78 acres.

Figure 1, *Topographic Map*, shows the project site location on the Bachelor Mtn. and Winchester 7.5' USGS topographic maps (T6S R2W Section 28). The UTM coordinates for the approximate center of the site are 11S 0491121mE x 3720624mN. Figure 2, *Aerial Photo*, shows the project site on an aerial photo. The elevation of the site ranges from 1,419 to 1,473 ft. above mean sea level. Site photos are found in Appendix A.

The parcel is within criteria cell 5275 (Southwest Area Plan, French Valley-Lower Sedco Hills subunit) of the western Riverside Multi-Species Habitat Conservation Plan (MSHCP; County of Riverside 2016b). Because the project site is found within a criteria cell, this report includes a habitat assessment for species and sensitive habitats identified by the MSHCP and an MSHCP Consistency Analysis (RCA 2007a, 2007b).

2. METHODS

Literature Review

A literature review was used to determine the potential special status species and communities found on the project site and proposed road easement. The review included previous biological surveys conducted in the project vicinity (Caltrans 2007, 2010; Dodson 2015; The Planning Center 2012; and SCE and AECOM 2014).The distribution of special status plant species that may occur on the project site was obtained from the California Natural Diversity Database (CNDDB; CDFW 2016a) RareFind Data Base for the Bachelor Mtn., Winchester, Murrieta, and Romoland Quadrangles and the CNPS online rare plant inventory (CNPS 2016).Collection records of the special status species known from the project region were reviewed (Consortium 2016).Details on phenology and habitats preferences was derived from the MSHCP species accounts (Dudek 2003), published floras and checklists (Baldwin et al. 2012, Munz 1974, Roberts et al. 2004, Roberts et al. 2007), RCA monitoring reports (RCA 2011b),and critical habitat designations (USFWS 2010a, 2010b, 2012) for the federally listed species. The presence of the special status plant species was documented by a voucher collection, photo documentation, and GPS waypoints using a Garmin 60CSX GPS receiver).

Information on the special status wildlife species consisted of a review of the CNDDB Rarefind Database (CDFW 2016a), MSHCP species accounts (Dudek 2003), biological studies in the project region (AMEC 2001a, 2001b; 2007; LSA 2003; PCR 2012b, Principe 2010b), and RCA monitoring reports (RCA 2009, 2012b; RCHCA 1995).

The soils on the site were determined using the Websoils website (NCRS 2016) with further detail obtained from the soil survey for western Riverside County (Knecht 1971).

The MCHCP requirements for the parcels were obtained from the county conservation summary report (County of Riverside 2016b) and from the County GIS website (County of Riverside 2016a). The information from these websites noted that the parcel is located in Criteria Cell #5275, and information on the County survey and reporting procedures was obtained. This included a review of the requirements for a Habitat Assessment (County of Riverside 2009), MSHCP Consistency Analysis (RCA 2007a and 2007b),HANS reporting procedures (County of Riverside 2006b), and burrowing owl survey protocols (County of Riverside 2005a, 2006a).

Field Surveys

The initial botanical and sensitive plant community assessments were performed by David Bramlet on August 19, 2016. The agricultural field along SR-79 in the lower elevations of the site had been disked prior to the survey, and little vegetation was present in this area. For the rest of the site, many plants were identified from dried remains and some annual plants may have been overlooked due to the late season conditions. Focused plant surveys were not conducted because it was too late in the season to locate any of the criteria area or narrow-endemic plant species required for the review of the proposed Flossie Way access road. Under the MSHCP, focused plant surveys are not required for the two parcels that comprise the main project site.

An updated habitat assessment for Narrow Endemic and Criteria Area Plant Species was conducted in March 2017 at the western end of the Flossie Road ROW. The survey in August of 2016 found this area had been disked and it was not fully possible to determine the potential of the habitat at this locality to support NEP or CAS species at this site. A survey was conducted on March 2, 2017 for approximately five hours on a clear, calm day with temperatures ranging from 59oF to 71oF.The site examination was conducted when most plants would be identifiable; the entire area was walked and all plant species observed were recorded in field notes. A general review of the entire project site was also conducted on this date, to determine the changes in floristic composition from the August 2016 site examination.

The second survey was performed on March 10, 2017 for a period of 2.5 hours on a calm, cool day with scattered clouds. The purposed of the site visit was to document the condition of the ponded road ruts within the Flossie Way ROW. The survey area for the NEP and CAS species was also examined on foot to determine if there were any changes in floristic diversity or phenology at this locality.

To document the condition of NEP and CAS species, five reference areas were examined in the western Riverside region during March 2017.These site visits documented the existing condition of various spineflower species, the smooth tarplant, Munz's onion, Coulter's goldfields, the San Jacinto Valley saltbush, and the San Diego ambrosia.

Plant communities were mapped by recording field observations on an aerial photograph. The nomenclature for the communities generally follow Holland (1986, CDFW 2010) with the exception of annual grassland, which was named "non-native grassland" and the addition of the non-vegetative mapping units (e.g. developed). Scientific and common names generally follow the Vascular Plants of western Riverside County: An annotated checklist (Roberts et al. 2004, 2007), although some nomenclature from the Jepson Manual (Baldwin et al. 2012) and other botanical publications (Allen and Roberts 2013) is followed. The names for the special status plant species (narrow endemic, and criteria area species) follow the CNPS online Rare Plant Inventory (CNPS 2016).

The evaluation of the potential presence of vernal pools and other ephemeral wetlands was conducted using aerial photos to supplement the field observations. The historical aerial photos used were dated 6/1/2002, 10/20/2003, 1/11/2007, 5/24/2009, and 4/26/2011.

The wildlife survey and burrowing owl habitat assessment study was carried out on November 5, 2016 by Phil Brylski, Ph.D. The project site and surrounding area was surveyed for wildlife generally and for sensitive species such as the burrowing owls and their sign (burrows, pellets, feathers, scat, and litter). The weather during the

survey was mild temperatures (78F to 82F), clear skies, and low winds (0-3 mph). Due to the presence of burrows on the site that could potentially be used by burrowing owls, a protocol survey was carried out in accordance with the survey guidelines for the species (County of Riverside 2006a; CDFW 2012, Burrowing Owl Consortium 1993). The methods of the burrowing owl survey are included in Section 5 of this report.

3. Environmental Setting

The proposed school site contains agricultural and other vacant lands, as well as two residences. The surrounding areas are rural residential, agricultural, or open land, with off-site rural residences to the north and west of the site. High density suburban residential developments are located approximately 1,500 ft. south of the project site.

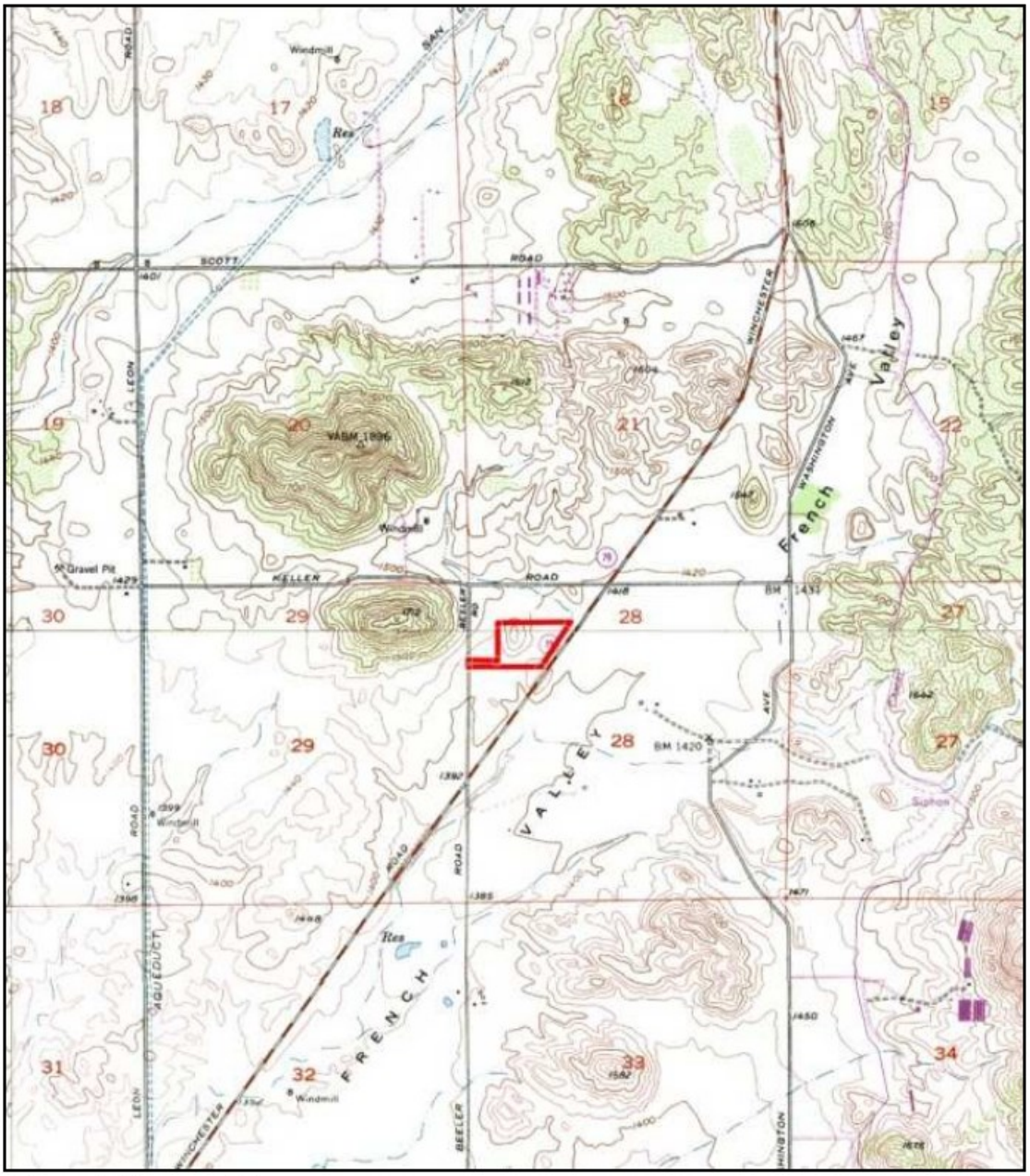

Figure 1. Topographic map

Figure 2. Aerial Photo

Topography and Hydrology

The project site contains a knoll in the western part where the residences are located, which slopes gently to the east to a flat area along SR-79 and to the west to the parcel boundary. The level lands on both sides are in agricultural use. There are no channels, erosion rills, or seasonal wetlands on the project site. There are two culverts on Highway 79 that drain storm flows from the property but there are no channels associated with these culverts. Ponding was observed in two road rut features within the Flossie Road ROW (Photo 13) on March 2, 2017, but the ruts were dry by March 8.

The precipitation in the French Valley area in 2015-2016 was approximately 9.3 inches. Although rainfall in 2015-2016 was above the average of 7.21 inches for the region, it was not a good year for many annual plant species. The rainfall for the 2016-2017 water year was approximately 15.9 inches on March 7, 2017. The temperatures during the rainy 2016-2017 season have been cooler, with some unusually high rainfall events (e.g., 1.92 inches of rain fell on February 27, 2017; Weather Currents 2017).

Soils

The soils on the project site consist of gravelly and sandy loams and one clay soil type. None of the soils are listed on the National Hydric Soils List as hydric. The soils units from the soils report (NRCS 2016) are as follows:

- Lodo gravelly loam (LoF2);
- Garretson very fine sandy loam (GaC);
- Friant fine sandy loam (FwE2); and
- Escondido fine sandy loam (EcC2).

The soils on the Flossie Way access road are as follows:

- Altmont clay (AaF),
- Escondido fine loamy sand (EcD2),
- Friant fine sandy loam (FwE2); and
- Lodo gravelly loam (LoF2).

The distribution of the soil types on the project site are shown in Figure 3, *Soils Map*.

Figure 3. Soils Map

Plant Communities

The plant communities found on the parcel include agricultural, disturbed annual grassland, Riversidian sage scrub/grassland ecotone, graded, and developed. Figure 4, *Plant Communities* shows the distribution of plant communities on the site. Appendix B lists the plant species observed. The following section describes the mapping units.

Agricultural

The eastern part of the project site is agricultural, which had been disked at the time of the initial survey and later was planted in wheat (*Triticum aestivum*). The margins of the field contain pockets of a disturbed annual grassland with ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), red brome (*Bromus madritensis* ssp. *rubens*), schismus (*Schismus barbatus*), and foxtail barley (*Hordeum murinum* ssp. *leporinum*).Common forbs included cheeseweed (*Malva parviflora*), Russian thistle (*Salsola tragus*), common fiddleneck (*Amsinckia intermedia*), London rocket (*Sisymbrium irio*), red maids (*Calandrinia menziesii*), hare's ear cabbage (*Sisymbrium orientale*), rattlesnake weed (*Euphorbia albomarginata*), tocalote (*Centaurea melitensis*), pygmy sand weed (*Crassula connata*), white-stemmed filaree (*Erodium moschatum*), Shepherd's purse (*Capsella bursa-pastoris*), Persian knotweed (*Polygonum argyrocoleon*), hairy vetch (*Vicia villosa*), curly dock (*Rumex crispus*), and jimson weed (*Datura wrightii*).

Disturbed Annual Grassland

A disturbed annual grassland is the dominant plant community in the remaining parts of the project site. Grasses in this community include ripgut brome, foxtail barley, red brome, wild oat, rattail fescue (*Festuca myuros*), and schismus. Forbs consisted of red maids, white-stemmed filaree, common fiddleneck, miniature lupine (*Lupinus bicolor*), shiny peppergrass (*Lepidium nitidum*), bur clover (*Medicago polymorpha*), long-beaked filaree (*Erodium botrys*), summer mustard (*Hirschfeldia incana*), tocalote, London rocket, rattlesnake weed, red-stemmed filaree (*Erodium cicutarium*), dove weed (*Croton setiger*), vinegar weed (*Trichostema lanceolatum*), Russian thistle, paniculate tarplant (*Deinandra paniculata*), and jimson weed. A few shrubs including common sand aster (*Corethrogyne filaginifolia*), coastal isocoma (*Isocoma menziesii*), and interior California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*) were uncommonly found in these grasslands.

Several small rocky sites on the project site had open patches dominated by Russian thistle. Other disturbed areas along Highway 79 had a grassland with patches of tocalote, telegraph weed (*Heterotheca grandiflora*), annual sunflower (*Helianthus annuus*), schismus, bur clover, Persian knotweed, grab lotus (*Acmispon micranthus*), common horseweed (*Conyza canadensis*), long-beaked filaree, summer cypress (*Kochia scoparia*), prickly lettuce (*Lactuca serriola*), dove weed, serrate-leaved saltbush (*Atriplex suberecta*), London rocket, and summer mustard.

The Flossie Road Right of Way (ROW) is a disturbed annual grassland that borders a field of planted cultivated oat (*Avena sativa*). Much of the ROW is a disturbed annual grassland where annual grasses such as foxtail barley, ripgut brome, red brome and shismus were more common than cultivated oat. Other annual plants found on the ROW include redmaids, black mustard (*Brassica nigra*), shiny pepper grass, red brome, foxtail barley, Sahara mustard (*Brassica tournefortii*), stink net (*Oncosiphon piluliferum*), Shepherd's purse, common fiddleneck, cheeseweed, bur clover, Russian thistle, scarlet pimpernel (*Anagallis arvensis*), miniature lupine, and pygmy sand weed.

Riversidian sage scrub-grassland ecotone

A few of the larger patches of interior California buckwheat on the project site were mapped as a Riversidian sage scrub/grassland ecotone. These sites had scattered shrub cover and were generally dominated by annual

grasses and forbs. Other shrub species occasionally found in these ecotonal areas consisted of common sand aster, coastal isocoma, and California sagebrush (*Artemisia californica*).The sites were characterized by a cover of ripgut brome, wild oat, red brome, common fiddleneck, Russian thistle, tocalote, finger-leaved morning glory (*Calystegia macrostegia*), summer mustard, and dove weed.

Graded

The existing access road to the residences was mapped as graded. This unit consists of a hard packed earthen road and other disturbed areas that lack vegetation.

Developed

The area around the existing residences and garage was mapped as developed, which includes graded areas around the structures, a concrete basketball court, and driveways. This area includes a number of planted ornamental species including Aleppo pines (*Pinus halepensis*), Shamel ash (*Fraxinus uhdei*), olive (*Olea europea*), Silver dollar gum (*Eucalyptus polyanthemos*), pecan (*Carya illinoinensis*), and queen palms (*Syagrus romanzoffiana*).

Table 1 lists the acreages of the plant communities on the project site.

Table 1. Plant Community Areas

Plant Community	Area (acres)
Agricultural	7.33
Disturbed annual grassland	7.23
Riversidian sage scrub/annual grassland ecotone	0.10
Graded	0.36
Developed	1.24
total	**16.27**

Wildlife

The wildlife observed on the project site is typical for its developed and agricultural land uses. The birds observed on the site include the western meadowlark (*Sturnella neglecta*), Say's phoebe (*Sayornis saya*), common raven (*Corvus corax*), white-crowned sparrow (*Zonotrichia leucophrys*), and mourning dove (*Zenaida macroura*). Two mammal species observed included the California ground squirrel (*Otospermophilus beecheyi*) and Botta pocket gopher (*Thomomys bottae*). Appendix C lists the wildlife species observed on the site.

4. Special Status Species and Habitats

Special status plant species include those plants listed by the state or federal governments as endangered, threatened or rare, species that are candidates for future listing, and species determined by the California Department of Fish and Wildlife (CDFW) to meet the CEQA (Section 15380) criteria as "rare and endangered" even if they have not been officially listed by any agency (CDFW 2016b, c). The list also considers those species noted by the California Native Plant Society (CNPS 2016), by the County of Riverside as "rare or endangered" or of limited distribution and requiring consideration in CEQA or planning studies in the region (e.g., the Western Riverside County MSHCP, County of Riverside 2003a, Dudek 2003), or as species of special concern by local botanists in the region (Roberts et al. 2004, 2007).

Figure 4. Plant Communities

Communities of special interest are considered to be "depleted" habitats of special interest to the CDFW (CDFW 2010), the County of Riverside (County of Riverside 2003a), or potentially regulated by the Corps of Engineers, CDFW, Regional Water Quality Control Board or other agencies.It would also include the criteria areas of the western Riverside MSHCP, which are the potential reserve areas for this habitat conservation plan (County of Riverside 2003a).

Special Status Plant Species

Table 2 lists the Special Status plant species that have been recorded in the project area (CNDDB 2016a, Consortium 2016) and which potentially occur on the project site. Table 3 lists the plant species known from the project region but not expected to occur on the project site.

Table 2. Special Status Plant Species Potentially Occurring on the Project Site

Species	Federal/ State	CNPS/ MSHCP Other	Known or Expected Localities	Comments
Abroniavillosa var. *aurita* Chaparral sand verbena		CRPR 1B.1, NCS	Domenigoni-Diamond Valley, Winchester, Murrieta Creek, Temescal Valley, San Jacinto River, South of Hemet, Vail Lake, Gavilan Hills, Banning Bench, San Jacinto Mtns.	Found in Open sandy washes, sandy openings in coastal sage scrub. Blooms from January to September. Not anticipated on the project site.
Allium munzii Munz's onion	FT, SE	CRPR 1B.1, CS, NEPS	Paloma Valley, Lake Skinner Skunk Hollow, Paloma Valley, N. Domenigoni Hills, Temescal Valley, Gavilan Hills	Generally found in dense clay soils, but also on gabbronic substrates. Blooms from March to May. Not anticipated on the project site.
Ambrosia pumila San Diego ambrosia	FE	CRPR 1B.1, CS, NEPS	Skunk Hollow, South of Skunk Hollow, Nichols Road (Elsinore Area), Temescal Valley.	Found in annual grasslands. Blooms from April to October. Does not occur on the project site.
California macrophylla Large-leaf filaree		CRPR 1B.1, CS, ASNP, CAS	Bachelor Mtn., Gavilan Hills, Hills between Murrieta & Menifee Valley, Murrieta, Temescal Valley, Murrieta region & the Lake Elsinore region.	Found in clay soil grasslands. Blooms from March to May. Not anticipated on the project site.
Calochortus weedii var. *intermedius* Intermediate mariposa lily		CRPR 1B.2, CCS	Murrieta, French Valley, Crown Valley, Vail Lake, Corona, Santa Ana Mtns.	Found in coastal sage scrub or chaparral. Blooms from May to July. Not anticipated on the project site.
Centromadia pungens ssp. *laevis* Smooth tarplant		CRPR 1B.1, CS, ASNP, CAPS, RR/VP	French-Paloma Valleys, Murrieta Creek, Temecula Creek, Warm Springs Creek, Lake Elsinore region, San Jacinto River-Perris, Lakeview, SJWA, Upper Salt Creek, Diamond Valley, Tucalota Creek, San Jacinto Valley, Santa Ana River	Found in alkali meadows or grasslands. Also found on the margin of riparian habitats in the region. Blooms from April to September. Not anticipated on the project site.

Table 2. Special Status Plant Species Potentially Occurring on the Project Site				
Chorizanthe parryi var. *parryi* Parry's spineflower		CRPR 1B.1, CCS	French-Paloma Valleys, Lake Skinner, Sedco Hills, Menifee region, Bundy Canyon, Crown Valley, N. Domenigoni Hills, Lake Elsinore region, W. Hemet Hills, Gavilian Hills, Box Sprngs Mtn. Lakeview Mtns.	Found principally in alluvial fans and openings of coastal sage scrub. Blooms from April to June. Not anticipated on the project site.
Chorizanthe polygonoides var. *longispina* Long-spined spineflower		CRPR 1B.2, CS	Lake Skinner region, Menifee Valley, Warm Springs Creek, Murrieta region, Temecula region, Bundy Cyn. Skunk Hollow, Garner Valley, W. Hemet Area, Gavilan Hills, TemescalCyn., Alberhill, Santa Rosa Plateau	Found on clay soils or eroded loams in annual grasslands. This species is found scattered on clayish substrates throughout the Perris Basin. Blooms from April to July. Not anticipated on the project site.
Convolvulus simulans Small-flowered morning glory		CRPR 4.2, CS	Paloma Valley, Lake Skinner region, French Valley Skunk Hollow, TemescalCyn., Gavilan Hills, Vail Lake	Found on clay soils in clay grasslands, generally on heavy clays. Blooms from March to July. Observed on Flossie Rd ROW.
Deinandra paniculata Paniculate tar plant		CRPR 4.2, NCS	French-Paloma Valleys, Murrieta-Temecula-Lake Elsinore region, Menifee Valley, Perris Valley region, San Jacinto Valley, Moreno Valley, Gavilan Hills	Found in annual grasslands. Blooms from March to November. Observed on the project site.
Harpagonella palmeri Palmer's grappling hook		CRPR 4.2, CS	French Valley, Lake Skinner, Murrieta, Menifee Valley, Bundy Cyn., Temecula, Gavilan Hills, Alberhill, Skunk Hollow, TemescalCyn. W. Hemet Hills, Vail Lake	Found in clay soil grasslands. Blooms from March to May. Not anticipated on the project site.
Juglans californica California black walnut		CRPR 4.2, CS, RR/VP	French Valley, Paloma Valley Murrieta Creek, Lake Skinner region, Riverside, Santa Ana River, Moreno valley, Jurupa Hills	Found on margins of alluvial washes, margins of riparian woodland, oak woodland, and coastal sage scrub-chaparral. Blooms from March to August. Does not occur on the project site.
Lepidium virginicum var. *robinsonii* Robinson's pepper grass		CRPR 1B.2, NCS	French Valley, Lake Skinner-Crown Valley, N. Domenigoni Hills, W.Hemet Hills, Murrieta-Menifee Valley,Vail Lake, Gavilan Hills, Perris Valley, Sedco Hills, Box Springs Mtns.	Found uncommonly scattered throughout the Perris Basin, San Bernardino Basin. This peppergrass blooms from Jan. to March and can be difficult to identify after this period. Not anticipated on the project site
Microseris douglasii ssp. *platycarpha* Small-flowered microseris		CRPR 4.2, CCS	French Valley, Paloma Valley, Lake Skinner region, Menifee Valley, Warm Springs Creek, Gavilan Hills, Lake Elsinore region, W. Hemet Hills, Temescal Cyn., Perris Basin, Santa Rosa Plateau	Found on clay soil grasslands. Blooms from March to May. Not anticipated on the project site.

Table 2. Special Status Plant Species Potentially Occurring on the Project Site				
Pentachaeta aurea Golden-rayed pentachaeta		CRPR 4.2, NCS	Temecula, San Jacinto Mtns.	Found in openings of coastal sage scrub or in annual or perennial grassland habitats. Blooms from March to July. Poorly documented and anticipated to occur in grasslands and scrub habitats throughout the inland valley. Not anticipated on the project site.

Federal Designations:
FE = Listed by the Federal government as endangered.
FT = Listed by the Federal government as endangered
BLM = A BLM sensitive plant species.

State Designations:
SE =Listed as endangered by the State of California.
ST Listed by the State of California as threatened.
SR Listed by the State of California as rare

Western Riverside MSHCP
CS = Plant species covered w/in the MSHCP
CCS =Plant species conditionally covered w/in the MSHCP; coverage conditional on the plan meeting species specific objectives.
NCS =Plant species not covered w/ in the MSHCP
NEPS = Plant species on the list of Narrow endemic plant species.
ASNP=Plant species on the list of Additional Survey needs and procedures list.
RR/VP=Plant species on the Riparian/Riverine & Vernal pool list.
CAPS =Plant species included on the list of Criteria Area Species

California Native Plant Society (CNPS), Rare Plant Rank (RPR):
RPR 1A = Plants presumed extinct in California.
RPR 1B = Plants considered rare, threatened or endangered in California and elsewhere.
RPR 2 = Plants rare, threatened or endangered in California but more common elsewhere.
RPR 3 = Plants about which we need more information - A review list.
RPR 4 = Plants of limited distribution - A watch list.

CNPS Threat Code Extensions
.1 = Seriously endangered in California.
.2 = Fairly endangered in California.
.3 = Not very endangered in California.

Chaparral sand verbena (*Abronia villosa* var. *aurita*) is a perennial herb found in areas of fine sand, often on benches of alluvial habitats, but also in openings of scrub or grassland communities. In the project region the chaparral sand verbena has been recorded from the sandy wash areas of Murrieta Creek, Pechanga Creek, and Temescal Canyon. It is also known from the sandy areas of the Domenigoni-Diamond Valleys and the Winchester area. There are no records in the French Valley-Bachelor Mountain area. The chaparral sand verbena is a CRPR 1B.1 species that is not covered by the MSHCP. This species is not anticipated to occur on the project site due to the lack of fine sandy soils.

Munz's onion (*Allium munzii*) is found on clay soils from the Temescal Valley, Gavilan Plateau-Estelle Mtn., Santa Ana Mountains, and into the Perris Basin. In the study region this species is known from localities at Bachelor Mountain, the north Domenigoni Hills, near Skunk Hollow and a site on either side of Lindenberger road, and just north of Keller Road. Munz's onion is a federally threatened and a state endangered species and is covered under the MSHCP as a narrow endemic plant species. This onion occurs on deep clay soils and has been well documented in the Paloma Valley, Skunk Hollow, Bachelor Mountain, and the Domenigoni Hills.Other known localities include the Gavilan Hills, Temescal Valley, and Alberhill region. The Munz's onion is not anticipated to occur on the project site, due to the lack of deep, clay soils and the disturbed condition of the clay soil habitat.

San Diego ambrosia (*Ambrosia pumila*) is a federally listed perennial herb found in annual grasslands on floodplain terraces or the margin of ephemeral wetlands. This ambrosia is found in western Riverside and San Diego Counties, and in western Riverside the known localities are limited to the Skunk Hollow area, an area south of Skunk Hollow, the Nichols Road area, and Temecula Creek. The San Diego ambrosia is listed as federally endangered species, a California Rare Plant Rank 1B.1 species, and a covered plant species within the MSHCP. The MSHCP includes this species on the additional survey needs and procedures list as a narrow

endemic plant species. In the French Valley region this species is only known from a locality south of Skunk Hollow. This species does not occur on the project site.

Large-leaved filaree (*California macrophylla*) is found on clay soils mostly in the Temescal Valley-Gavilan Hills region, Vail Lake area, and at scattered sites in the Perris Basin. In the general region this species has been documented from Bachelor Mountain, Skunk Hollow, Vail Lake, Nichols Road area, and the hills between Murrieta and Menifee Valley. The large-leaved filaree is a California Rare Plant Rank 1B.1 species and a covered species under the MSHCP. The MSHCP includes this species on the additional survey needs and procedures list, as a criteria area plant species. This species is not anticipated to occur on the project site due to the lack of deep clay soils and the disturbed condition of the clay soil habitat.

Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*) is a late blooming mariposa lily found in rocky areas of Riversidian sage scrub. In western Riverside County this species has been recorded from the northeastern area of the Santa Ana Mountains (Corona area), Crown Valley, Vail Lake, and in the vicinity of the intersection of Clinton Keith Road and the I-215.The mariposa lily is a California Rare Plant Rank 1B.2 species and a conditionally covered species under the MSHCP. This mariposa lily is not anticipated to occur on the project site, due to the lack of rocky, Riversidian sage scrub at this locality.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*) is broadly distributed in alkali grasslands, alkali wetlands and disturbed alkali soils within the Perris Basin, and Santa Ana River Basin. In the region this tarplant is known from Warm Springs Creek, Murrieta Creek, Lake Elsinore, Auld Valley, Menifee Valley, French-Paloma Valleys, and Temecula. This tarplant is a California Rare Plant Rank 1B.2 species and a covered species under the MSHCP. The MSHCP includes this species on the additional survey needs list as a criteria area plant species and is on the riparian/riverine/vernal pool plant species list. This species is not anticipated to occur on the project site, due to the lack of moist alkali soils.

Parry's spineflower (*Chorizanthe parryi* var. *parryi*) is a small, white-flowered, spineflower found in the openings of chaparral, sage scrub, alluvial fan sage scrub and Juniper woodland. This species is known to occur in Los Angeles, San Bernardino and Riverside Counties, principally in the alluvial fan areas along the San Gabriel and San Bernardino Mountains. In the inland valley area, the species is found in openings of Riversidian sage scrub and chaparral, usually on sandy soils. In the Inland Riverside-San Bernardino area, the species is known to occur from the Gavilan Hills to Banning-Palm Springs and from the base of the San Bernardino Mountains to Vail Lake area. In the study region it has been recorded from Sedco Hills, Murrieta, Menifee, French-Paloma Valleys, west Hemet Hills, Lake Skinner-Crown Valley, N. Domenigoni Hills, the Lakeview Mountains and Gavilan Hills. Parry's spineflower is a California Rare Plant Rank List 1B.1 species and is a conditionally covered species within the MSHCP. This spineflower is not anticipated to occur on the project site, due to the lack of open, sandy soils in Riversidian sage scrub.

Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*) generally occurs on clay substrate, along with other clay soil species, such as the Palmer's grappling hook. However, it also located on heavy loams in open, dry sage scrub. The long-spined spineflower ranges from the inland valleys of Riverside County to San Diego County and into Baja California. In western Riverside County this species is known to occur in concentrations of clay soils including French-Paloma Valley, Bachelor Mtn.-Lake Skinner region, Bundy Canyon, Murrieta-Temecula region, Santa Rosa Plateau, Temescal Valley-Gavilan Hills, Vail Lake and the Santa Rosa Plateau. The long-spined spineflower is a California Rare Plant Rank List 1B.2 species and is a covered species under the MSHCP. The long-spined spineflower is not anticipated to occur on the project site, due to the disturbed condition of the clay soil area, lack of typical features of the preferred habitat, e.g. exposed red clay soils, and a lack of plant species typically associated with this spineflower.

Small-flowered morning glory (*Convolvulus simulans*) is restricted to clay soil areas from Central California and extending into Baja California. Currently most of the recent populations known from Inland Riverside County including Paloma Valley, Murrieta, Skunk Hollow, the Gavilan Hills (Temescal Valley), Temescal Valley, Lake Skinner County Park, Santa Rosa Plateau, and Vail Lake areas. The small-flowered morning glory is a California Rare Plant Rank 4.2 species, and is a covered species under the MSHCP. Eight individual plants were observed in the northwestern part of the Flossie Way ROW.

Paniculate tarplant (*Deinandra paniculata*) is found in cismontane Riverside, southern Orange and San Diego Counties. This species also extends into northern Baja California. The San Diego tarweed is found in grasslands and Riversidian sage scrub throughout the lower valleys of western Riverside County. In the project region this tarplant has been documented from French Valley, Paloma Valley, Domenigoni-Diamond Valley, Murrieta, Wildomar, Temecula, and other areas within the Perris basin. The paniculate tarplant is a California Rare Plant Rank 4.2 species, and is not a covered species under the MSHCP. This tarplant was documented from the southeastern edge of the property by Caltrans (2007) and was observed on the project site.

Palmer's grappling hook (*Harpagonella palmeri*) is a widely distributed, small annual species which occurs from Los Angeles County to Baja California. It generally occurs on clay slopes and burns at lower elevations. It is often associated with other clay soil species, especially the small-flowered microseris and the clay bindweed. Currently, populations are known to occur in the French Valley, Paloma Valley, Bachelor Mtn.-Lake Skinner area, Murrieta Hot Springs region, Santa Rosa Plateau, Temescal Valley-Gavilan Hills region, and the Vail Lake region. Palmer's grappling hook is a California Rare Plant Rank 4.2 species, and is a covered species within the MSHCP. This species is not anticipated to occur on the project site due to the disturbed conditions in the clay soil locality, lack of suitable conditions, e.g. open clayey habitat, and a lack of plant species typically associated with the Palmer's grappling hook.

Southern California black walnut (*Juglans californica*) is a shrub to small tree that occurs only in southern California.The center of distribution for this species appears to be in the Chino-La Puente Hills on the Los Angeles-Orange County border. Walnuts also extend along the base of the San Gabriel mountains in alluvial fan sage scrub in Los Angeles, San Bernardino and Riverside Counties. Since this species was used for disease resistance root stock for horticultural walnuts, it is often difficult to determine the origin of California walnut trees in rural and suburban areas. In western Riverside County this species is known to occur in Riverside, along the Santa Ana River, the Perris Basin, and Jurupa Hills-Reche Canyon area. It has also been documented from the San Gorgonio wash and in Millard Canyon in the Cabazon area. The California walnut is a California Rare Plant Rank 4.2 species, and is a covered species under the MSHCP. The species does not occur on the project site.

Robinson's peppergrass (*Lepidium virginicum* ssp. *robinsonii*) is an erect annual with white flowers. Dry openings in rocky coastal sage scrub are the preferred habitat for this peppergrass. This peppergrass species occurs in cismontane region of southern California, including the Channel Islands, south to northern Baja California.In western Riverside County this variety is known from: French Valley, Bachelor Mtn.-Lake Skinner region, Menifee Valley, West Hemet Hills, Domenigoni Hills, Menifee Valley, Temescal Valley-Gavilan Hills region, Box Springs Mtns., Corona, and Vail Lake region. Robinson's peppergrass is a California Rare Plant Rank 4.3 species and is not a covered species under the MSHCP. This species would not be anticipated to occur on the project site, due to the lack of sandy soils within Riversidian sage scrub.

Small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*) is restricted to clay soils and has a limited distribution in southern California. In the region this species is known from French-Paloma Valley, Lake Skinner (Bachelor Mtn.), Gavilan Hills (Temescal Canyon), Lake Elsinore region (Alberhill), Santa Rosa Plateau, Big Oak Mountain, and Vail Lake. This microseris species is a California Rare Plant Rank 4.2 species and is a conditionally covered species under the MSHCP. This species is not anticipated to occur on the project site, due

to the disturbed conditions in the clay soil locality, lack of suitable conditions, e.g. open clayey habitat, and a lack of plant species typically associated with this microseris species.

Golden-rayed pentachaeta (*Pentachaeta aurea*) is a small yellow flowered annual that is restricted to southern California, extending into Baja California. This early blooming annual is found in openings of coastal sage scrub, or grasslands and extends into mid-elevational chaparral and lower montane coniferous forest.In Riverside County this species has been recorded from Temecula, 7 miles east of Temecula along DePortola Road, Idlyllwild, Tahquitz meadow, Thomas Mountain, Garner Valley and Whitewater. This pentachaeta is a California Rare Plant Rank 4.2 species and is not a covered species under the MSHCP. This species would not be anticipated to occur on the project site, due to the lack of suitable habitat, current levels of disturbance, and a lack of documentation of the occurrence of this species in the French Valley area.

Table 3.Plant Species of Special Interest Known to Occurin the Region, but not Anticipated in the Vicinity of the Project Site

Species	Federal/ State	CNPS/MSHCP/ Other	Known or Expected Localities	Comments
Allium marvinii Marvin's onion		CRPR 1B.1, CS NEPS	Santa Rosa Plateau, Elsinore Peak, Vail Lake, San Jacinto Mtns, Yucaipa, Calimesa, Potrero Reserve, Banning (historic)	Found on clayish soils in openings of scrub or grassland communities. Formerly consisted restricted to the Yucaipa-Banning-Potrero areas. A recent revision of this species has expanded the range south in western Riverside and San Diego Counties.
Atriplex davidsonii Davidson's saltscale		CRPR 1B.2, CS, ASNP, CAPS,	San Jacinto Wildlife Area, San Jacinto River, Upper Salt Creek, Nichols Road	Found in alkali grasslands, alkali playa habitats.The Jepson manual identifies this material as *A. coulteri*, although these plants appear to be distinct from the coastal populations of *A. coulteri*.
Atriplex parishii Parish's brittlescale		CRPR 1B.1, CS, ASNP, CAPS	Upper Salt Creek, Winchester	Found in alkali grasslands. Also known from extant populations in San Diego County, and other historic localities along the desert margins.
Brodiaea filifolia Thread-leaved brodiaea	FT, CE	CRPR 1B.1, CS, ASNP, CAS, RR/VP	San Jacinto River, SJWA, Upper Salt Creek, Santa Rosa Plateau	Found in clay or silty clay soils in grassland habitats.
Calochortus plummerae Plummer's mariposa lily		CRPR 1B.2, CCS	Lake Skinner, Jurupa Hills, Box Springs Mtns. W. Hemet Hills, Foothills of the San Jacinto Mtns	Found in coastal sage scrub or chaparral, including alluvial fan areas.
Crypthantha wigginisi Wiggin's cryptantha		CRPR 1B.1, NCS	Temecula (Skunk Hollow), Carlsbad	Found on open gabbro soils on the margins of Riversidian sage scrub.
Dudleya multicaulis Many-stemmed dudleya		CRPR 1B.2,CS, NEPS	Gavilan Hills, Alberhill, La Sierra Hills, Temescal Canyon, SA Mtns. Serrano Spring	Found in clay soils or sandstone outcrops in sage scrub or native grasslands.
Hordeum inercedens Vernal barley		CRPR 3.2,CS, RR/VP	French Valley, San Jacinto River, SJWA, Upper Salt Creek, Lake Elsinore	Found in alkali wetlands, vernal pools, alkali grasslands.

Table 3.Plant Species of Special Interest Known to Occurin the Region, but not Anticipated in the Vicinity of the Project Site				
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields		CRPR 1B.1, CS, ASNP,CAPS, RR/VP	Temecula, Upper Salt Creek, San Jacinto River, SJWA, San Jacinto, Nichols Road,Riverside, San Jacinto Mtns.	Found in alkali wetlands.
Mimulus diffusus Palomar monkey flower		CRPR 4.2, CS	Lake Skinner, San Jacinto Mtns, Bautista Cyn.	Found in the understory or openings of Riversidian sage scrub or chaparral.
Myosurus minimus ssp. *apus* Little mousetail		CRPR 3.1, CS, ASNP, CAPS, RR/VP	Menifee, Murrieta Creek area, Elsinore,Upper Salt Creek, TemescalCyn., Santa Rosa Plateau	Found in vernal pools, ephemeral wetlands
Navarretia fossalis Spreading navarretia	FT	CRPR 1B.1, CS, ASNP, NEPS, RR/VP	Menifee Valley,Paloma Valley, Murrieta, Wildomar Upper Salt Creek, San Jacinto River, SJWA,	Found in vernal pools, ephemeral wetlands.
Orcuttia californica California orcuttgrass	FE, CE	CRPR 1B.1, CS, NEPS, RR/VP	Menifee Valley, Wildomar, Skunk Hollow, Santa Rosa Plateau, Upper Salt Creek	Found in vernal pools
Quercus engelmani Engelmann's oak		CRPR 4.2, CS	Sedco Hills, Temecula, Santa Rosa Plateau, Gavilan Hills, Lake Skinner region, Murrieta region	Oak woodlands.
Trichochoronis wrightii Wright's trichochoronis		CRPR 2B.1, CS, NEPS	San Jacinto River.	Found in alkali wetlands.
See Table 2 for description of abbreviations.				

Rare Plant Survey Results

The initial survey found approximately 138 paniculate tarplant in the disturbed annual grasslands on the project site and in the Flossie Way access road. The locations of the paniculate tarplant on the project site are shown in Figure 5, *Biological Features*. The March 2017 field survey found eight small-flowered morning glory plants in the northwestern part of the Flossie Way ROW. No other special status plant species were observed or would be anticipated to occur on the project site and access road.

Special Status Wildlife Species

Special status wildlife are species that have been given special recognition by federal, state, or local conservation agencies and organizations due to limited, declining, or threatened population sizes and those species recognized by local and regional resource agencies as sensitive. Table 4 lists the animal special status species that have the potential to occur in the project area.

Table 4. Special Status Animal Species Known From Project Region				
Species Name	**Status***	**Habitat Preference**	**MSHCP**	**Potential to Occur on Project Site**
Invertebrates				
Riverside fairy shrimp	FE	Restricted to a few vernal pools in	Covered	No suitable habitat

Table 4. Special Status Animal Species Known From Project Region				
Species Name	**Status***	**Habitat Preference**	**MSHCP**	**Potential to Occur on Project Site**
Streptocephalus woottoni		southwestern Riverside, Orange, and San Diego counties.		on the main project site. Two road ruts located in the Flossie Way ROW were inundated for 8 days in March 2017, which are not considered sufficient for reproduction to occur.
Branchinecta lynchi vernal pool fairy shrimp	FT	Occurs mostly in vernal pools but also found other natural and artificial seasonal wetland habitats.	Covered	Same as for Riverside fairy shrimp
Quino checkerspot butterfly		Open areas within coastal sage scrub or chaparral below 5,000 feet elevation where food plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) are present.	Covered	No potential due to lack of suitable habitat.
Amphibians				
Western spadefoot *Spea hammondii*	CSC	Open areas with sandy or gravelly soils, in a variety of habitats including grasslands, chaparral, and sandy washes. Shallow pools in these habitats are necessary for reproduction. Breeds in ponds, streams, and rain pools.	Covered	Known from project vicinity but low potential to occur onsite due to lack of suitable habitat.
Reptiles				
Orange-throated whiptail *Aspidoscelis hyperythrus*	CSC	Prefers coastal sage scrub and woodland habitats with sandy openings. Known from project vicinity (CNDDB).	Covered	Known from project vicinity but low potential to occur onsite due to lack of suitable habitat.
Coastal western whiptail (*Aspidoscelis tigris stejnegeri*)	CSC	Occurs in range of habitats, including ruderal road edges, agricultural margins, low, sparse grassland, and mature coastal sage scrub, chaparral, and big sagebrush scrub.	Covered	Moderate potential to occur on project site.
Northern red-diamond rattlesnake *Crotalus ruber ruber*	CSC	Arid scrub (including coastal sage scrub), chaparral, woodlands, and cultivated areas, often with large rocks or boulders.	Covered	Low potential due to lack of suitable habitat.
San Diego coast horned lizard *Phrynosoma coronatum blainvillei*	CSC	Occurs in variety of habitats including coastal sage, grassland, chaparral, oak woodland, and riparian woodland with loose sandy soils and abundant native ants or other insects.	Covered	Known from project vicinity, low potential to occur onsite due to disturbed habitat.
Birds				
Cooper's hawk *Accipiter cooperii*	CSC (nesting	Occurs in various woodland habitats, including riparian.	Covered	Moderate potential to forage on project

Table 4. Special Status Animal Species Known From Project Region				
Species Name	**Status***	**Habitat Preference**	**MSHCP**	**Potential to Occur on Project Site**
	only)			site, but no nests observed in ornamental trees on the site.
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	CSC	Occurs in sparsely vegetated scrubland on hillsides and canyons, preferring coastal sage scrub dominated by California sagebrush (*Artemisia californica*) and grassy successional growth.	Covered	Sparse shrubs on project site provide low potential for nesting.
Bell's sage sparrow *Artemisiospiza belli belli*	CSC	Occurs in coastal sage scrub and chaparral, preferably semi-open with shrubs 1–2 m high.	Covered	No potential to occur on project site.
Burrowing owl *Athene cunicularia*	CSC	Open grassland, fallow fields, sparsely vegetated desert scrub, and edges of disturbed lands, where soil is friable for nesting burrows.	Covered	Suitable habitat occurs onsite. California ground squirrel burrows occur on site, but no burrowing owls or their sign observed.
California horned lark *Eremophila alpestris actia*	CSC	Occurs in a variety of open habitats, and in southern California breeds mainly in open fields, grasslands, and rangelands.	Covered	Low potential for nesting onsite due to discing of lowland grasslands.
Loggerhead shrike *Lanius ludovicianus*	CSC (nesting)	Occurs in grassland, open sage scrub, chaparral, and desert scrub. Species apparently has declined dramatically in coastal southern California in recent years.	Covered	Moderate potential for nesting in ornamental trees on project site, but nests not observed.
Coastal California gnatcatcher *Polioptila californica californica*	FT CSC	Occurs primarily in coastal sage scrub habitat, but also use chaparral, grassland, and riparian habitats where they occur in proximity to sage scrub.	Covered	No potential due to absence of suitable habitat. The coastal sage scrub habitat on project site is sparse and degraded.
Mammals				
San Diego black-tailed jackrabbit *Lepus californicus bennetti*	CSC	Occurs in a variety of habitats , including sage scrubs, chaparral, agricultural lands and other disturbed habitats, but prefers open grassland.	Covered	Moderate potential to occur onsite, but not observed during field survey.
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	CSC	Inhabits coastal sage scrub and alluvial fan sage scrub habitats.	Covered	Low potential to occur onsite due to disturbed habitat conditions.
Northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	CSC	Occurs mainly in sage scrub, chaparral, and grassland habitats.	Covered	High potential to occur onsite.
Stephen's kangaroo rat	FE ST	Occurs in open grassland and sparse coastal sage scrub habitats on	Covered by SKR HCP	No suitable habitat onsite.

Table 4. Special Status Animal Species Known From Project Region				
Species Name	**Status***	**Habitat Preference**	**MSHCP**	**Potential to Occur on Project Site**
Dipodomys stephensi		friable well-drained soils.		
San Diego desert woodrat *Neotoma bryanti intermedia*	CSC	Occurs in scrub and desert habitats, usually in association with rock outcroppings, boulders, cacti, or areas of dense undergrowth.	Covered	Low potential to occur onsite due to sparse shrub and rock cover.
Southern grasshopper mouse *Onychomys torridus ramona*	CSC	Occurs in flat, sandy, valley floor habitats, in range of scrub and grassland habitats.	Covered	Low potential to occur onsite.
Federal FE Federally Endangered FT Federally Threatened FPT Federally Proposed Threatened FSC Federal Species of Concern (=BCC) BLM S Sensitive species		State SE State Endangered ST State Threatened	State Department of Fish and Wildlife (CDFW) CSC California Species of Concern CFP California Fully-Protected Species SA Special Animal	

Figure 5.Biological features. (RR, road ruts 1 &2; green circles: paniculate tarplant; red and blue squares: burrows with potential for use by burrowing owls, mapped during November 2016 and March 2017, respectively.)

Habitat Assessment for Sensitive Wildlife

Fairy Shrimp

Two listed species of fairy shrimp are known from the project region: the vernal pool fairy shrimp (*Branchinecta lynchi*), a federally threatened species, and the Riverside fairy shrimp (*Streptocephalus woottoni*), a federally endangered species. No vernal pools or seasonal wetlands were observed during the 2016 surveys of the site and Flossie Rd ROW. The criteria for seasonal wetlands and other ponded features to be considered potential fairy shrimp habitat was based on the following: (1) the feature is inundated to at least

3cm; and (2) the ponded feature should be inundated for a sufficient duration for a listed large branchiopod to complete its lifecycle (USFWS 2015).

During the survey for Narrow Endemic Plant Species on March 2, 2017, ponding was observed in two road rut features within the Flossie Road ROW (Photo 13). Figure 5, *Biological Features*, shows the locations of these road ruts. Rut #1 was located 300 ft. from Pourry Road and 35 ft. south of the northern boundary of the parcel, and on March 2, 2017 measured approximately 28 ft. in length, 1 ft. wide, and 6.8 cm deep. Rut #2 was located 890 ft. east of Pourry Rd. and 40 ft. south of the parcel boundary, and was ponded for 6 ft. in length, 8 inches wide, and 1.3 cm. deep. Only one of the tracks in the second rut was ponded, and the ponding extended for a length of 9 ft., 9 inches wide, and 3.8 cm deep.

The ponded road ruts were assessed for meeting the inundation criteria for fairy shrimp habitat (USFWS 2015). It is likely that these road ruts filled on February 27, 207 during an unusual rain event (Weather Currents 2017). The initial observations were conducted three days following that event (March 2, 2017). The road ruts within the Flossie Rd ROW were dry within 10 days of when the road ruts were assumed to have ponded (observed on March 10, 2017) and eight days following the first survey. These road ruts appeared to have actually dried within eight days, as observed by the wildlife biologist. Therefore, these road ruts would not be considered to have ponded for a sufficient duration to provide suitable habitat for listed fairy shrimp species. No ponding was observed on the two parcels that form the project site. These recent survey guidelines note a seven or ten day period for sampling period, which is assumed to represent the life cycle of some fairy shrimp species (USFWS 2015). However, the Riverside fairy shrimp cysts typically require at least seven to twenty one days to hatch and some eight weeks to mature (USFWS 2012b), while the vernal pool fairy shrimp requires some 18-147 days to mature (USFWS 2007, Caltrans 2007). Other recent studies (AMEC 2012) have used an eight day duration period as the criteria for a suitable period of duration for these seasonal wetlands.

Quino Checkerspot Butterfly

The Quino checkerspot butterfly occurs in chaparral, cismontane woodland, coastal scrub, and native and introduced grasslands. Larval food plants include dwarf plantain(*Plantago erecta*), *P. patagonica*, white snap dragon (*Antirrhinum coulterianum*), bird'sbeak(*Cordylanthus rigidus*), and owl's clover (*Castilleja exserta*). Nectar plants consist mainly of small annuals such as *Lasthenia* spp., *Cryptantha* ssp., *Gilia* ssp., *Linanthus dianthiflora*, *Salvia columbariae*, *Lotus* spp., and *Eriodictyon* spp. There is a CNDDB record (CDFW 2016) for this species approximately 3.65 miles north/northwest of the project site from 1997. The project site does not contain any of the host plant or nectar sources that are used by this species, and there is no potential for the species to occur there.

Burrowing Owl

See Chapter 5.

Special Status Communities

The project site lacks any special status habitats known to occur in the region.

Riversidian sage scrub. The Riversidian sage scrub-grassland ecotone found on the project site would not be considered a special status community due to the very low shrub cover found in this grassland.

Jurisdictional Waters and Wetlands. The project site does not contain riparian habitat, open drainages, erosional channels or other features that could contain plant species associated with riparian habitats. A blue-line channel is found on the property that adjoins the site to the north. The Highway 79 Natural Environmental Study (Caltrans 2004) indicates that this blue-line channel extends into the extreme northeastern tip of the

project site. However, no channel was observed in this area during the 2016 field survey. Currently, it appears that the channel has been filled in on the adjacent property and only overland flows currently occur on the project site.

Ephemeral Wetlands and Vernal Pools. Seasonal wetlands, including vernal pools, are communities that could support special status plant or animal species. No seasonal wetlands were observed on the two parcels that form the project site. Two road rut features were noted to be ponded on March 2, 2017 within the Right of Way (ROW) of Flossie Road (Photo 13). However, these features were only ponded for eight days, and this would not be sufficient for these road ruts to be considered seasonal wetlands or habitat for listed fairy shrimp. In addition, seasonal wetlands were not noted in historical Google Earth aerial photographs reviewed for this study.

Wildlife Movement Corridors

Wildlife corridors link areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. Corridors link different populations of a species and mitigate the effects of habitat fragmentation by 1) allowing animals to move between remaining habitats (which allows replenishment of depleted populations and promotes genetic diversity); 2) providing escape routes from fire, predators, and human disturbances that put populations or local species at risk; and 3) serving as travel routes for individuals moving within their home ranges for food, water, mates, and shelter. Wildlife movement activities usually fall into one of three movement categories: dispersal, seasonal migration, or movements related to home range activities. Large open spaces will generally support a diverse wildlife community representing all types of movement. Wildlife movement may range from non-migratory movement of amphibians, reptiles, and some birds on a local level to the many-square-mile home ranges of large mammals moving at a regional level.

The project site is located in a rural residential and agricultural area of French Valley. The immediate neighborhood consists of rural residences and farmland. Extensive high density residential development occurs approximately 1,400 feet to the south. The open areas of Bachelor Mtn and the foothills around Diamond Lake Reservoir occur as close as one mile east of the project site. The project site is largely vacant, with two residences and plant communities dominated by grassland and agricultural lands with no riparian habitats. Winchester Ave (SR-79) borders the project site to the east. There are two culverts beneath Highway 79 but there are no channels associated with these culverts.

Landscape features in rural landscapes that support important wildlife movement functions include aquatic and riparian habitats, and ridgelines, particularly when they are in proximity to a known wildlife movement corridor. None of these features occur on the project site or adjoining areas. The project site is expected to support movement by coyotes and skunks and other local wildlife as a result of normal home range movements, possibly including some wildlife use of the culverts beneath SR-79 along the eastern project border. However, the project site does not contain a wildlife corridor or significantly contribute to wildlife movement.

A regionally important wildlife corridor identified in the MSHCP occurs in the project region: Proposed Constrained Linkage 18 is a narrow strip of riparian habitat along an unnamed drainage that links Paloma Valley (southwest of the project site) and the Bachelor Mountain area (east of the project site across SR-79). This linkage is approximately 1,400 feet south of the project site. The southern part of the linkage is adjoined by high density residential development. The MSHCP planning species for this linkage area are bobcat and Los Angeles pocket mouse.

5. BURROWING OWL SURVEY

The western burrowing owl is a ground-nesting owl that inhabits grassland habitats, often in areas that have been disturbed as a result of agriculture and suburban development. They frequently use burrows excavated by the California ground squirrel (*Otospermophilus beecheyi*) and use pipes and other natural and non-natural cavities at or below ground level. The entrances to burrows are often indicated by the presence of whitewash and other sign (scat, feathers, and litter). Burrowing owls require open fields with adequate food supply for foraging habitat, low vegetative cover to allow owls to watch for predators, and adequate roosting sites. These owls can often be seen perched or standing by their burrow or hunting insects, rodents, amphibians, or small birds in open fields. Nesting season is from February through August, with most pairs usually fledging 4 or 5 young. After the nesting season, most owls in California remain throughout the winter as year-round residents and owls from others areas augment resident California populations. Burrowing owls are susceptible to predators that can access their nest chamber, such as foxes, coyotes, skunks, raccoons, and snakes, and are also preyed upon by various other raptor species, such as hawks, eagles, and other species of owls.

The CNDDB (CDFW 2016) contains records of nesting burrowing owls in the project vicinity. A habitat assessment for burrowing owls on the project site identified potential burrows that could be used by burrowing owls. Burrows constructed by California ground squirrels were found on the project site. No western burrowing owls were observed or otherwise detected onsite or in adjoining areas during the survey. Based on the occurrence of potentially suitable burrowing owl habitat on the project site, a protocol survey was carried out in March 2017.

Methods

Literature Review. Prior to the field survey, the literature was reviewed for records of burrowing owl and other sensitive wildlife species on the project site and its vicinity. The literature included the California Natural Diversity Database (CDFW 2016), the Riverside County Multiple Species Habitat Conservation Plan (County of Riverside 2003), and population information on burrowing owls summarized in Center for Biological Diversity (2003).

Field Surveys. The project site and surrounding areas were surveyed for burrowing owls and their sign (burrows, pellets, feathers, scat, and litter) in accordance with the County's burrowing owl survey instructions (County of Riverside 2006). A habitat assessment carried out on November 5, 2016 by Phil Brylski, Ph.D found that all of the habitat on the project site is potentially suitable for burrowing owls. No western burrowing owls were observed or otherwise detected onsite or in adjoining areas during the habitat assessment but eight burrows constructed by California ground squirrels on the project site that could be used by burrowing owls for refuge or nesting were mapped. The foot-surveys included the project site and the adjoining agricultural field to the south of the project site. The fenced residences west and north of the project site, and the agricultural fields east of SR-79 were surveyed by visual inspection using binoculars. Potential burrowing owl burrows were mapped using a GPA (Garmin, 60CSx; accuracy +/- 3 meters).

A focused burrowing owl survey was carried out on five separate days (March 7-10, March 30, 2017) under mild weather conditions suitable for the survey (Table 5). The site received 100% survey coverage by systematically walking the project site. The distance between transect center lines was no more than 30 meters (100 feet). A buffer area that extended 500 feet around the site borders was also surveyed. Parts of the buffer that are private property were surveyed using binoculars from the project site, its borders, and local roads. These included the rural residential areas that adjoin the project site to the west and north, and the agricultural lands east of SR-79. Figure 6, *Burrowing owl survey information*, shows the locations of burrows that could be used by burrowing owls, the general locations of the 100-foot transects, and the perimeter of the 500-foot buffer area.

Results

The project site is within the historical range of the burrowing owl. In western Riverside County, burrowing owls are sparsely distributed throughout the region, occurring mainly in open lowland areas (County of Riverside 2003). The California Natural Diversity Database (CDFW 2016) contains several burrowing owl records from the project vicinity in 2006, including multiple pairs at burrows approximately 0.23 miles west and 0.77 miles west of the Flossie Rd ROW.

The weather during the burrowing owl habitat assessment and survey was warm temperatures, clear skies, and low winds.

Table 5. Weather data for the burrowing owl survey

Date	Time	Temperature (F)	Wind (mph)	Cloud (%)
3/7	0645-1000	53-69	1-3	15
3/8	1630-1845	82-68	0	0
3/9	1700-1900	79-64	1-4	0
3/10	0715-0900	59-75	1-3	25-60%
3/30	1730-1930	74-80	0-1	0

Figure 6.Burrowing owl survey information: potentially suitable burrows (blue and red squares), 100-foot transect intervals (green vertical lines), and 500-foot buffer (yellow line).

The burrows that could be used by burrowing owls were constructed by California ground squirrels (CGS). No potential burrows were observed in rock crevices, debris piles, or agricultural features such as well culverts. The CGS burrows on the site were typically 4-6 inches diameter. In November 2016, when the habitat

assessment was carried out, the burrows were located in sparsely vegetated to barren areas. However, by late 2016 and early 2017, the habitat around the burrows was overgrown by dense non-native annual grasses. Photo 14 shows a typical CGS burrow on the project site during the burrowing owl survey.

The focused survey for burrowing owls did not find any burrowing owls or their sign on the project site or in the buffer area.

6. MSHCP CONSISTENCY ANALYSIS

MSHCP Criteria Cell Issues

The project site and the Flossie Way access road are located in Criteria Cell #5275 within the French Valley - Lower Sedco Hills subunit of the Southwest Area Plan of the western Riverside MSHCP (County of Riverside 2016b).Biological issues and considerations for this subunit are as follows: (1) conserve a large block of habitat generally east of I-215 and south of Scott Road for narrow endemic species; (2) provide connection to the Southwestern Riverside County Multi Species Reserve, (3) conserve clay soils supporting long-spined spine flower, Munz's onion and Palmer's grappling hook, (4) maintain core and linkage habitat for bobcat, (5) determine presence of potential Core Area for Los Angeles pocket mouse along Warm Springs Creek, (6) maintain core and linkage habitat for Quino checkerspot butterfly, (7) maintain core area for western pond turtle, and (8) maintain core area for Riverside fairy shrimp.

Other goals for this subunit include conserving clay soil areas for narrow endemic plant species that are restricted to these soil types, including the Munz's onion, and habitat for the Quino checkerspot butterfly.

Table 6 lists the checklist information on the project site from the County Conservation Summary Report Generator. The project site is not within with survey requirements for any amphibians, or mammals, but is located within a habitat assessment area for the burrowing owl. The project site is not within an existing or proposed core area.

Table 6. MSHCP Review Summary	
Is the project located in Criteria Area or Public/Quasi-Public Land?	Yes
Is the project located in Criteria Area Species Survey Area(CASSA)?	Yes*
Is the project located in Amphibian Species Survey Area?	No
Is the project located in Mammal Species Survey Area?	No
Is the project located adjacent to MSHCP Conservation Areas?	No
Is the project located in Narrow Endemic Plant Species Survey Area (NEPSA)?	Yes*
Are riverine/riparian/wetland habitats or vernal pools present?	No
Is the project located in Burrowing Owl Survey Area?	Yes
* The main project site (APNs 476-010-059 and 476-010-013) is not within a CASSA or NEPSA . The Flossie Way access road area (part of APN 476-010-054) is within a CASSA and NEPSA.	

Criteria Cell Coverage

The project site is located in the north-central part of Cell #5275 in an area that is not proposed for conservation. Clay soils are absent from the two parcels where the school would be built, however a small area of clay soils mapped by NRCS (2016) occurs in part of the 1.78 acre easement for the Flossie Way access road. The MSHCP (County of Riverside 2003b) identifies the conservation objectives of Cell #5275 as follows:

> "Conservation within this Cell will contribute to assembly of Proposed Constrained Linkage 18. Conservation within this Cell will focus on riparian scrub, woodland and forest habitat and adjacent agricultural land. Areas conserved within this Cell will be connected to riparian scrub, woodland and forest habitat and agricultural land proposed for conservation in Cell #5376 to the south and to agricultural land proposed for conservation in Cell #5372 to the east. Conservation within this Cell will range from 10% to 20% of the Cell focusing in the southern part of the Cell".

A regionally significant wildlife corridor identified in the MSHCP is Constrained Linkage 18, which is located south of the project site (Figure 7, *Project Site in relation to MSHCP Criteria Cells and Constrained Linkage 18*). Constrained linkage 18 is a narrow strip of riparian habitat along an unnamed drainage that links Paloma Valley (southwest of the project site) and Bachelor Mountain (east of the project site across SR-79). The linkage is constrained by adjoining agricultural uses, which, along with the narrow width of the riparian area, contribute to a large edge effect. The planning species for this linkage area are bobcat and Los Angeles pocket mouse.

The MSHCP describes the linkage as follows:

> "Proposed Constrained Linkage 18 consists of an unnamed drainage located in the south-central region of the Plan Area. This Constrained Linkage connects Proposed Core 2 (Antelope Valley) to the west with Proposed Extension of Existing Core 7 (Lake Skinner/Diamond Valley Lake Extension). Existing agricultural use constrains the Linkage, and planned land uses surrounding the Linkage are limited nearly entirely to community Development. The Linkage also has a relatively high proportion of land affected by edge (approximately 250 acres of the total 310 acres) and will also be subject to Edge Effects also due to the widening or extension of several facilities including Washington Street, Briggs Road, and SR-79. Despite these issues, the Linkage nonetheless provides Live-In and movement Habitat for species. Guidelines Pertaining to Urban/Wildlands Interface for the management of edge factors such as lighting, urban runoff, toxics, and domestic predators are presented in Section 6.1 of this document. This Linkage likely provides for movement of common mammals such as bobcat. An adequate wildlife underpass or overpass may need to be implemented to insure movement of species in this area and to reduce the chance of mortality from vehicle collision."

MSHCP Implementation Structure

Section 6.1.2.Protection of Species Associated with Riparian/Riverine Areas andVernal Pools

The project site does not contain riparian habitat, open drainages, erosional channels or other features that could contain plant species associated with riparian habitats. There is no suitable habitat for riparian birds on the project site. A blue-line channel is found on the adjoining parcel to the north of the project site. The Highway 79 Natural Environmental Study (Caltrans 2004) indicated that this blue-line channel extends into the extreme northeastern corner of the project site. However, no channel was observed in this area during the field survey. It appears that the channel has been filled in on the adjacent property and only overland flows currently occur on the project site.

Ephemeral Wetlands and Vernal Pools. Seasonal wetlands, including vernal pools, are communities that could support special status plant or animal species. No seasonal wetlands were observed on the two parcels that form the project site. Two road rut features were noted to be ponded on March 2, 2017 within the Flossie Road Right of Way (ROW) (Photo 13). However, these features were ponded for only eight days, which would not be sufficient for these road ruts to be considered seasonal wetlands or listed fairy shrimp habitat(USFWS 2015, AMEC 2012).In addition, seasonal wetlands were not noted in historical Google Earth aerial photographs reviewed for this study.

Section 6.1.3 Compliance: Protection of Narrow Endemic Plant Species

The main project site (APNs 476-010-059 and 476-010-013) is not within a Narrow Endemic Plant Survey Area (NEPSA). However, the proposed Flossie Way access road (APN 476-010-054) is within a NEPSA. The NEPSA species that should be surveyed for are Munz's onion, San Diego ambrosia, many-stemmed dudleya, spreading navarretia, California orcutt grass, and Wright's trichocoronis. Additional botanical

surveys were carried out on March 2 and 10, 2017 to survey for these species and further evaluate the potential for NEP species to occur within the survey area within the Flossie Way ROW. The surveys found that this area contained dense annual grasses and forbs, along with areas of cultivated oats. No suitable habitat for any of the NEP species was observed due to the lack of deep clay soils, and moist silt-clay alkali species, vernal pools, and summer inundated wetlands. The dense annual grass and forb cover within the Flossie Way ROW do not provide suitable habitat for the NEP species.

Section 6.3.2 Compliance: Additional Survey Needs and Procedures

The project site and the Flossie Way access road areas are within an area required for a habitat assessment for the western burrowing owl, which was carried out, followed by a protocol survey.

The main project site (APNs 476-010-059 and 476-010-013) is not within a Criteria Area Species Survey Area (CASSA). The Flossie Way proposed access route is within a CASSA for the following plant species: Davidson's saltscale, Parish's brittlescale, thread-leaved brodiaea, smooth tarplant, round-leaved filaree,Coulter's Goldfields, and little mousetail. Botanical assessments carried out on March 2 and 10, 2017 further evaluated the potential for the CAS species to occur within the Flossie Way ROW. The surveys found that the area contained dense annual grasses and forbs with areas of cultivated oats. No suitable habitat for any of the CAS species was observed due to the lack of deep clay soils, moist silt-clay alkali soils, vernal pools, and alkali playa wetlands. In addition, the dense annual grass and forb cover found at this locality does not provide suitable habitat for the CAS species.

The Riverside County Parcel Report for APN 476-010-054 states that a previously proposed development for this parcel had completed biological surveys for burrowing owl and a habitat assessment for 13 species, and had been approved under the HANS process. This report was not available online, but should be available from the County Planning Department.

Burrowing Owl

A habitat assessment for western burrowing owls was carried out on the project site on November 5, 2016. No burrowing owls were observed or otherwise detected onsite (i.e., sign or calls) or in adjoining areas during the survey. Burrows constructed by California ground squirrels were found on the project site that could potentially be used by burrowing owls. Figure 6, *Burrowing Owl Survey Information*, shows the locations of the ground squirrel burrows. A focused survey for the burrowing owl was carried out from March 7-30, 2017. No burrowing owls or their sign were detected on the project site or in the buffer area.

MSHCP Consistency for Impacts to Riparian/Riverine/Vernal Pools Habitat

Seasonal wetlands, including vernal pools, are communities that could support special status plant or animal species. No seasonal wetlands ponding was observed on the two parcels that form the project site. Two road rut features were noted to be ponded on March 2, 2017 within the Right of Way (ROW) of Flossie Road. However, these features were only ponded for only eight days, and this would not be sufficient for these road ruts to be considered seasonal wetlands or listed fairy shrimp habitat (AMEC 2012).

In addition, seasonal wetlands were not noted in historical Google Earth aerial photographs reviewed for this study.

Section 6.1.4.Urban/Wildlands Interface Guidelines

Section 6.1.4 of the MSHCP presents guidelines that reduce indirect impacts to MSHCPconservation areas at the Wildlands/Urban interface. The project site is not in the vicinity of a conservation area and the Urban/Wildlife Interface Guidelines are therefore not applicable.

Reserve Assembly

The project site is located in the northwestern part of Cell #5275 in an area that is not proposed for conservation. The project site is not located in a designated core area and is located approximately 1,400 feet north of Constrained Linkage 18.

The objectives of Cell #5275 and an analysis of the proposed project's impactson these are as follows:

1. Contribute to assembly of Proposed Constrained Linkage 18.

Proposed Constrained Linkage 8is located approximately 1,400feet south of the project site. The land between the project site and the linkage is in agricultural use and is crossed by SR-79. The proposed project would not impact the assembly or wildlife movement function of Constrained Linkage 18.

2. Focus on coastal sage scrub (CSS), grassland, riparian scrub, woodland and forest habitat.

The project site contains disturbed annual grassland, tilled agricultural fields, small areas of Riversidian sage scrub/grassland ecotone, and developed uses. The proposed project would impact 41% of the disturbed annual grassland on the project site, leaving the remaining 59% in its existing condition. The Riversidian sage scrub-grassland ecotone found on the project site would not be considered a special status community due to the very low shrub cover found in this grassland.

3. Areas conserved within this Cell will be connected to riparian scrub, woodland and forest habitat and agricultural land proposed for conservation in Cell #5376 to the south and to agricultural land proposed for conservation in Cell #5279 to the east.

Since adoption of the MSHCP, Cell #5376 has been largely developed with residential land uses. The project site occurs in the northwestern corner of Cell #5275, separated from Cell #5279 by SR-79 and the agricultural lands in the northeastern corner of Cell #5275. This cell objective is not furthered by the habitats and location of the project site.

4. Conservation within this Cell will range from 10%-20% of the Cell focusing in the southern portion of the Cell.

The project site is located in the northwestern part of the Cell. This objective is not relevant to the project site. Nonetheless, the proposed project would develop approximately 63.6% of the site, leaving the two residences and surrounding habitats (36.4% of the site) undeveloped.

Figure 7.Project Site (red) in relation to MSHCP Criteria Cells and Constrained Linkage 18 (green line).

7. IMPACTS

The proposed project would convert part of the existing habitats of the proposed project site and access road to K-8 school land uses. The one-story school buildings totaling about 45,000 square feet of building area and associated school roads, playfields, and other infrastructure would be clustered in the eastern part of the site. Figure 8, *Project Impacts*, shows the development area of the proposed school on the plant communities map. The developed campus would cover approximately 10.35 acres, approximately 63.6% of the site. Table 7 summarizes the permanent impacts to the plant communities on the project site. There are no additional temporary impacts.

Table 7. Plant Community Impacts*

Plant Community	Existing	Impact % of existing in ()
Agricultural	7.33	7.22 (98.4)
Disturbed annual grassland	7.23	2.98 (41.2)
Riversidian sage scrub/annual grassland ecotone	0.10	.01 (7.1)
Graded	0.36	.15 (41.5)
Developed	1.24	0 (0)
total	**16.27**	**10.35 (63.6%)**

* All impacts are permanent. There are no temporary impacts onsite or offsite

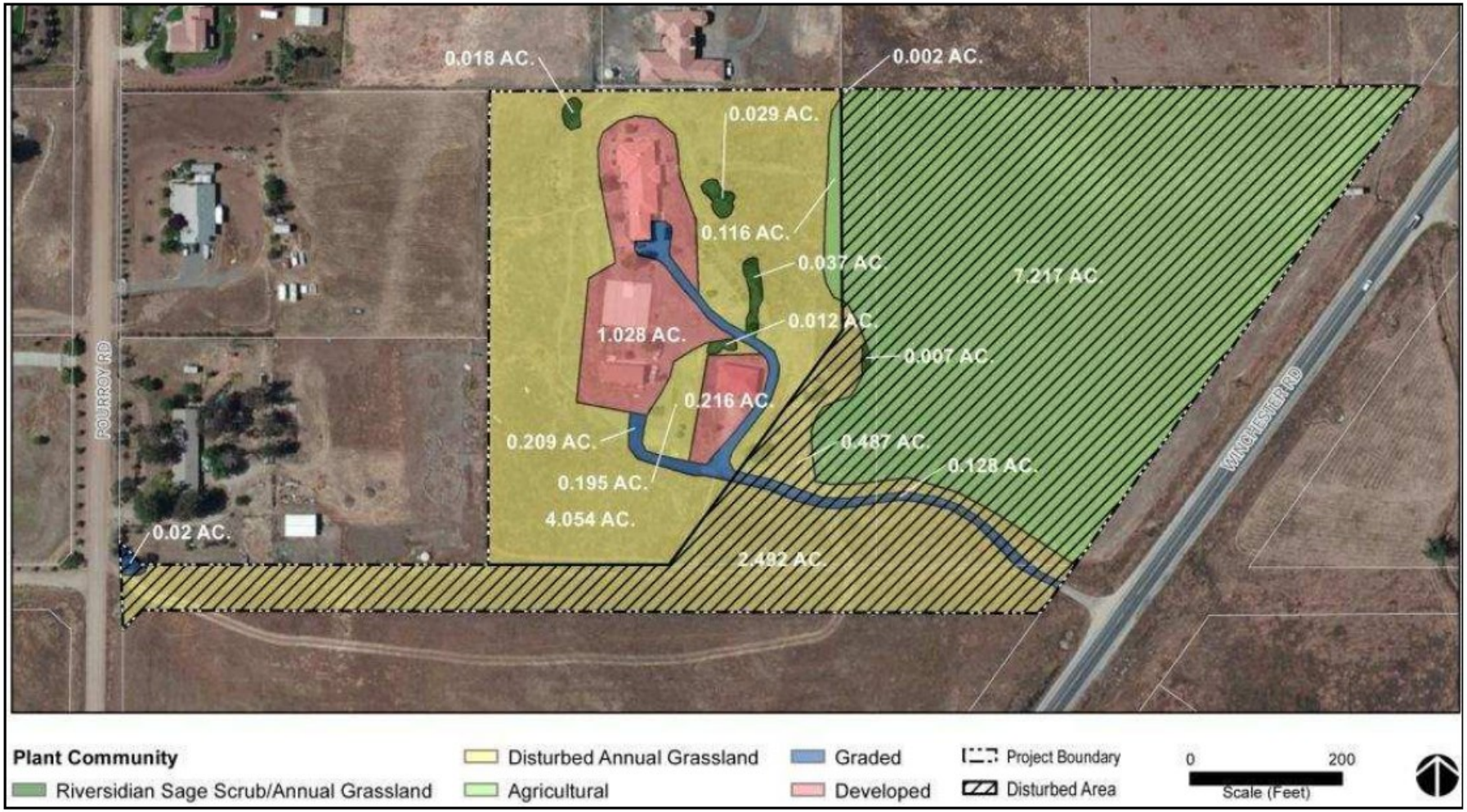

Figure 8. Project impacts (hatched area)

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant Impact with Mitigation Incorporated.

Sensitive Plants

No plant species that are listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW) were observed on the project site or have the potential to occur there. The proposed project would not impact any listed plant species. Two special status plant species were observed on the project site or in the Flossie Way ROW. The first species, the paniculate tarplant is not covered by the MSHCP. The proposed project would impact 32 of the estimated 138 (23%) paniculate tarplants on the site. The paniculate tarplant is a CNPS "watchlist" (CRPR 4.2) species that is common in western Riverside County. Therefore, potential impacts to this species are not considered significant and no mitigation is needed. The other special status species is the small-flowered morning glory which was observed in the Flossie Way ROW. Eight small-flowered morning glory plants would be impacted by the proposed project, which would not be significant because this species is common in western Riverside County and is covered by the MSHCP.

All of the other special status plant species known from the project area have very low or low potential to occur on the project site, and therefore would not be impacted by the proposed project.

Sensitive Animals

The conversion of the habitats on the project site to developed uses would adversely impact five sensitive wildlife species that have moderate or high potential to occur there. These are as follows:

- Coastal western whiptail
- Burrowing owl
- Loggerhead shrike
- San Diego black-tailed jackrabbit; and
- Northwestern San Diego pocket mouse.

All of the wildlife species that could be adversely impacted are covered under the MSHCP.

The habitat assessment for the burrowing owl yielded no observations of burrowing owls or sign but identified burrows created by California ground squirrels that could be used by burrowing owls for refuge and/or nesting. Although the focused survey found no burrowing owls on the project site, they could establish nests on the site or in the buffer prior to project initiation. The burrowing owl is a covered species under the MSHCP. Potential impacts to the burrowing owl would be mitigated to a less than significant level with implementation of Mitigation Measure BIO-1.

Nesting Birds

The proposed project would involve ground disturbance, grading and construction in habitats that have nesting birds. If construction or site preparation activities occur in or near vegetation during the bird nesting season (February 1 to August 31), the project could impact nesting birds. The Federal Migratory Bird Treaty Act

prohibits direct impacts to nesting birds and their nests and the California Fish and Wildlife Code (Section 3503.5) prohibits activities that take, possess, or destroy nests or eggs. The developer is required to comply with the Migratory Bird Treaty Act.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No impact. The project site lacks special status habitats. The Riversidian sage scrub-grassland ecotone found on the project site would not be considered a special status community due to the very low shrub cover found in this grassland. The project site does not contain riparian habitat, open drainages, erosional channels or other features that could contain plant species associated with riparian habitats.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No impact. The project site does not contain any blue line streams, seasonal wetlands, or other jurisdictional waters. The proposed project would not impact wetlands or other jurisdictional waters. No mitigation measures are needed.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No impact. The project site is located in a rural residential and agricultural area of French Valley. The immediate neighborhood consists of rural residences and farmland. Extensive high density residential development occurs approximately 1,400 feet to the south. The open areas of Bachelor Mtn and the foothills around Diamond Lake Reservoir occur as close as one mile east of the project site. The project site is mostly vacant with two residence and plant communities dominated by grassland and agricultural lands with no riparian habitats. Winchester Ave (SR-79) borders the project site to the east.

Landscape features in rural landscapes that support important wildlife movement functions include aquatic and riparian habitats and ridgelines, particularly when they are in proximity to a known wildlife movement corridor. None of these features occur on the project site or adjoining areas. The project site probably supports local home range movement by common wildlife but does not contain a wildlife corridor or significantly contribute to wildlife movement. There are two culverts outside the eastern site border beneath Winchester Ave (SR-79) but there are no channels associated with these culverts. Medium-sized carnivores such as coyote and skunk could cross SR-79 through the culverts or on the highway surface during the night-time. The proposed project and would not impact existing paths for local wildlife movement. The proposed project would increase use of the agricultural lands on the project site and increase traffic in the vicinity. These changes would occur largely during the day-time and would not significantly impact local wildlife movement.

An important wildlife corridor occurs in the project region: the Proposed Constrained Linkage 18 is a narrow strip of riparian habitat along an unnamed drainage that links Paloma Valley (southwest of the project site) and the Bachelor Mountain area (east of the project site across SR-79). This linkage is approximately 1,400 feet south of the project site. The southern part of the linkage is adjoined by high density residential development. The planning species for this linkage area are bobcat and Los Angeles pocket mouse. The project site is distant from Proposed Constrained Linkage 18 and is separated from it by SR-79. The proposed project would not impact wildlife movement in this regional corridor.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No impact. The preservation policies of the County's Multiple Open Space Element of the General Plan rely strongly on implementation of the MSHCP for achieving biological conservation objectives. The proposed project is consistent with the provisions of the Riverside County MSHCP, and is consistent with the General Plan in this respect.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No impact. The proposed project is consistent with the MSHCP, as examined in the following section.

MSHCP Criteria Cell Issues

The project site and Flossie Way access road are located in Criteria Cell #5275 within the French Valley - Lower Sedco Hills subunit of the Southwest Area Planof the western Riverside MSHCP (County of Riverside 2016b). Biological issues and considerations for this subunit are as follows: (1) conserve a large block of habitat generally east of I-215 and south of Scott Road for narrow endemic species; (2) provide connection to the Southwestern Riverside County Multi Species Reserve, (3) conserve clay soils supporting long-spined spine flower, Munz's onion and Palmer's grapplinghook, (4) maintain core and linkage habitat for bobcat, (5) determine presence of potential Core Area for Los Angeles pocket mouse along Warm Springs Creek, (6) maintain core and linkage habitat for Quino checkerspot butterfly, (7) maintain core area for western pond turtle, and (8) maintain core area for Riverside fairy shrimp.

Other goals for this subunit include conserving clay soil areas for narrow endemic plant species that are restricted to these soil types, including the Munz's onion, and habitat for the Quino checkerspot butterfly.

Table 8 lists the checklist information on the project site from the County Conservation Summary Report Generator. The project site is not within with survey requirements for any amphibians, or mammals, but is located within a habitat assessment area for the burrowing owl. The project site is not within an existing or proposed core area.

Table 8. MSHCP Review Summary

Is the project located in Criteria Area or Public/Quasi-Public Land?	Yes
Is the project located in Criteria Area Species Survey Area (CASSA)?	Yes*
Is the project located in Amphibian Species Survey Area?	No
Is the project located in Mammal Species Survey Area?	No
Is the project located adjacent to MSHCP Conservation Areas?	No
Is the project located in Narrow Endemic Plant Species Survey Area (NEPSA)?	Yes*
Are riverine/riparian/wetland habitats or vernal pools present?	No
Is the project located in Burrowing Owl Survey Area?	Yes

* The main project site (APNs 476-010-059 and 476-010-013) is not within a CASSA or NEPSA . The Flossie Way access road area (part of APN 476-010-054) is within a CASSA and NEPSA.

Criteria Cell Coverage

The project site is located in the north-central part of Cell #5275 in an area that is not proposed for conservation. Clay soils are absent from the two parcels where the school would be built, however a small area of clay soils mapped by NRCS (2016) occurs in part of the 1.78 acre easement for the Flossie Way access road. The MSHCP (County of Riverside 2003b) identifies the conservation objectives of Cell #5275 as follows:

> "Conservation within this Cell will contribute to assembly of Proposed Constrained Linkage 18. Conservation within this Cell will focus on riparian scrub, woodland and forest habitat and adjacent agricultural land. Areas conserved within this Cell will be connected to riparian scrub, woodland and forest habitat and agricultural land proposed for conservation in Cell #5376 to the south and to agricultural land proposed for conservation in Cell #5372 to the east. Conservation within this Cell will range from 10% to 20% of the Cell focusing in the southern part of the Cell".

A regionally significant wildlife corridor identified in the MSHCP is Constrained Linkage 18, which is located south of the project site (Figure 7, *Project Site in relation to MSHCP Criteria Cells and Constrained Linkage 18*). Constrained linkage 18 is a narrow strip of riparian habitat along an unnamed drainage that links Paloma Valley (southwest of the project site) and Bachelor Mountain (east of the project site across SR-79). The linkage is constrained by adjoining agricultural uses, which, along with the narrow width of the riparian area, contribute to a large edge effect. The planning species for this linkage area are bobcat and Los Angeles pocket mouse.

The MSHCP describes the linkage as follows:

> "Proposed Constrained Linkage 18 consists of an unnamed drainage located in the south-central region of the Plan Area. This Constrained Linkage connects Proposed Core 2 (Antelope Valley) to the west with Proposed Extension of Existing Core 7 (Lake Skinner/Diamond Valley Lake Extension). Existing agricultural use constrains the Linkage, and planned land uses surrounding the Linkage are limited nearly entirely to community Development. The Linkage also has a relatively high proportion of land affected by edge (approximately 250 acres of the total 310 acres) and will also be subject to Edge Effects also due to the widening or extension of several facilities including Washington Street, Briggs Road, and SR-79. Despite these issues, the Linkage nonetheless provides Live-In and movement Habitat for species. Guidelines Pertaining to Urban/Wildlands Interface for the management of edge factors such as lighting, urban runoff, toxics, and domestic predators are presented in Section 6.1 of this document. This Linkage likely provides for movement of common mammals such as bobcat. An adequate wildlife underpass or overpass may need to be implemented to insure movement of species in this area and to reduce the chance of mortality from vehicle collision."

MSHCP Implementation Structure

Section 6.1.2.Protection of Species Associated with Riparian/Riverine Areas andVernal Pools

The project site does not contain riparian habitat, open drainages, erosional channels or other features that could contain plant species associated with riparian habitats. A blue-line channel is found on the adjoining parcel to the north of the project site. The Highway 79 Natural Environmental Study (Caltrans 2004) indicated that this blue-line channel extends into the extreme northeastern corner of the project site. However, no channel was observed in this area during the field survey. It appears that the channel has been filled in on the adjacent property and only overland flows currently occur on the project site.

Ephemeral Wetlands and Vernal Pools. Seasonal wetlands, including vernal pools, are communities that could support special status plant or animal species. No seasonal wetlands were observed on the two parcels that form the project site. Two road rut features were noted to be ponded on March 2, 2017 within the Right of Way (ROW) of Flossie Road. However, these features were only ponded for only eight days, and this would not be sufficient for these road ruts to be considered seasonal wetlands or listed fairy shrimp habitat. In addition, seasonal wetlands were not noted in historical Google Earth aerial photographs reviewed for this study.

Section 6.1.3 Compliance: Protection of Narrow Endemic Plant Species

The main project site (APNs 476-010-059 and 476-010-013) is not within a Narrow Endemic Plant Survey Area (NEPSA). However, the proposed Flossie Way access road (APN 476-010-054) is within a NEPSA. The NEPSA species that should be surveyed for are: Munz's onion, San Diego ambrosia, many-stemmed dudleya, spreading navarretia, California orcutt grass, and Wright's trichocoronis. The botanical habitat assessment of the Flossie Way access route found that the area has been regularly disked for agricultural uses and concluded that NEP species have low potential to occur there. A habitat evaluation for the six Narrow Endemic Plant species was conducted on March 2, 2017. It was determined that the Flossie Way ROW does not contain potential habitat for these species due to the lack of suitable soils (deep clays), continued disturbance, and the lack of suitable seasonal wetlands, such as vernal pools, that are the potential habitat for these species. Based on this assessment, further surveys are not warranted.

Section 6.3.2 Compliance: Additional Survey Needs and Procedures

The main project site (APNs 476-010-059 and 476-010-013) is not within a Criteria Area Species Survey Area (CASSA). The Flossie Way proposed access route is within a CASSA for the following plant species: Davidson's saltscale, Parish's brittlescale, thread-leaved brodiaea, smooth tarplant, round-leaved filaree, Coulter's Goldfields, and little mousetail. The botanical habitat assessment concluded these species have low potential to occur within the Flossie Way proposed access route. The botanical habitat assessment concluded that these species would not be expected to occur on the project site or that the potential for their occurrence is very low. Based on this assessment, further surveys are not warranted.

A Riverside County Parcel Report for APN 476-010-015 states that a previously proposed development for this parcel had completed biological surveys for burrowing owl and a habitat assessment for 13 species, and had been approved under the HANS process. This report was not available online, but should be available from the County Planning Department.

Burrowing Owl

A habitat assessment for burrowing owls was carried out on the project site on November 5, 2016. No western burrowing owls were observed or otherwise detected onsite (i.e., sign or calls) or in adjoining areas during the survey. Burrows constructed by California ground squirrels were found on the project site that could potentially be used by burrowing owls. A focused survey was carried out on five site visits from March 7-30, 2017. The focused survey for burrowing owls did not find any burrowing owls or their sign on the project site or in the buffer area.

MSHCP Consistency for Impacts to Riparian/Riverine/Vernal Pools Habitat

There are no riparian or riverine habitats on the project site. No seasonal wetlands were observed on the two parcels that form the project site, and there is no opportunity for riparian-dependent species to occur on the site. Two road rut features were noted to be ponded on March 2, 2017 within the Right of Way (ROW) of Flossie Road. However, these features were ponded for only eight days, which is not be sufficient for these road ruts to be considered seasonal wetlands or listed fairy shrimp habitat. In addition, seasonal wetlands were not noted in historical Google Earth aerial photographs reviewed for this study.

Section 6.1.4.Urban/Wildlands Interface Guidelines

Section 6.1.4 of the MSHCP presents guidelines that reduce indirect impacts to MSHCP conservation areas at the Wildlands/Urban interface. The project site is not in the vicinity of a conservation area and the Urban/Wildlife Interface Guidelines are therefore not applicable.

Reserve Assembly

The project site is located in the northwestern part of Cell #5275 in an area that is not proposed for conservation. The project site is not located in a designated core area and is located approximately 1,400 feet north of Constrained Linkage 18.

The objectives of Cell #5275 and an analysis of the proposed project's impactson these are as follows:

1. Contribute to assembly of Proposed Constrained Linkage 18.

Proposed Constrained Linkage 8is located approximately 1,400 feet south of the project site. The land between the project site and the linkage is in agricultural use and is crossed by SR-79. The proposed project would not impact the assembly or wildlife movement function of Constrained Linkage 18.

2. Focus on coastal sage scrub (CSS), grassland, riparian scrub, woodland and forest habitat.

The project site contains disturbed annual grassland, tilled agricultural fields, small areas of Riversidian sage scrub/grassland ecotone, and developed uses. The proposed project would impact 39% of the disturbed annual grassland on the project site, leaving the remaining 61% in its existing condition. The Riversidian sage scrub-grassland ecotone found on the project site would not be considered a special status community due to the very low shrub cover found in this grassland.

3. Areas conserved within this Cell will be connected to riparian scrub, woodland and forest habitat and agricultural land proposed for conservation in Cell #5376 to the south and to agricultural land proposed for conservation in Cell #5279 to the east.

Since adoption of the MSHCP, Cell #5376 has been largely developed with residential land uses. The project site occurs in the northwestern corner of Cell #5275, separated from Cell #5279 by SR-79 and the agricultural lands in the northeastern corner of Cell #5275. This cell objective is not furthered by the habitats and location of the project site.

4. Conservation within this Cell will range from 10%-20% of the Cell focusing in the southern portion of the Cell.

The project site is located in the northwestern part of the Cell. This objective is not relevant to the project site. Nonetheless, the proposed project would develop approximately 63.6% of the site, leaving the two residences and surrounding habitats (36.4% of the site) undeveloped.

Mitigation Measures

BIO-1 A preconstruction clearance survey for burrowing owls shall be carried out by a qualified biologist within 30 days prior to ground disturbance, pursuant to California Department of Fish and Wildlife protocols (California Burrowing Owl Consortium 1993). Between February 1 and August 31 (nesting season), the preconstruction survey will include a 300-foot buffer; outside of this period, it will include a 100-foot buffer. If owls are found within the survey area during the nesting season, construction activities will not occur within 300 feet of the occupied burrows until nesting is completed. A qualified biologist must confirm that nesting has been completed prior to the removal of the work buffer restriction. If owls are found within the disturbance footprint outside of the February 1 through August 31 period, passive relocation (e.g., use of one-way doors and collapse of burrows) will occur.

Certification

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date:__May 4, 2017_____Signed:___ _____

Phil Brylski

Date:__May 4, 2017_____Signed:_____ _____

David Bramlet

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Appendix A. Site photographs

Photo 1.Looking west from the northeast corner of the property. (November 2016)

Photo 2. Looking north from the southeast corner of the project site. (November 2016)

Photo 3. Looking west along the driveway to the existing residences from Hwy 79. (March 2017)

Photo 4.Looking west from the south east corner of the project site. (November 2016)

Photo 5. Looking north, from the southwest corner of the project site. (November 2016)

Photo 6. Looking south, from the northwest corner of the project site. (November 2016)

Photo 7. Looking southeast, from the knoll in the northern area of the project site. (November 2016)

Photo 8. Looking south at the secondary residence and basketball court. (November 2016)

Photo 9.Looking north, along the Hwy 79 easement from the existing access road. (November 2016)

Photo 10.Looking south, along the Hwy 79 easement. (November 2016)

Photo 11.Looking west, along the Flossie Road easement. (March 2017)

Photo 12:Looking east, along the Flossie Road easement. (November 2016)

Photo 13. Road rut ephemeral wetland along the Flossie Road easement. (view looking west, March 2017)

Photo 14. California ground squirrel burrow in southwestern part of proposed school site (March 2017).

Appendix B. Plant Species Observed

*-Non-native species
†-Special status plant species

GYMNOSPERMS
CONIFEROPHYTA, CONE-BEARING PLANTS

Pinaceae (Pine Family)
Aleppo pine (**Pinus halepensis*)

MAGNOLIOPHYTA, Flowering Plants

EUDICOTYLEDONES, EUDICOTS

Amaranthaceae (Amaranth Family)
Tumbling pigweed (**Amaranthus albus*)

Asteraceae (Sunflower Family)
western ragweed (*Ambrosia psilostachya*)
California sagebrush (*Artemisia californica*)
tocalote (**Centaurea melitensis*)
common horseweed (*Conyza canadensis*)
common sand aster (*Corethrogyne filaginifolia*)
Australian brass buttons (**Cotula australis*)
paniculatetarplant (†*Deinandra paniculata*)
eurypos (**Euryops pectinatus*)
annual sunflower (*Helianthus annuus*)
telegraph weed (*Heterotheca grandiflora*)
smooth cat's ears (**Hypochaeris glabra*)
coastalisocoma (*Isocoma menziesii*)
prickly lettuce (**Lactuca serriola*)
narrow-leaved filago (**Logfia gallica*)
stink net (**Oncosiphon piluliferum*)
groundsel (**Senecio vulgaris*)
prickly sow thistle (**Sonchus asper*)
common sow thistle (**Sonchu soleraceus*)

Boraginaceae (Forget-Me-Not Family)
common fiddleneck (*Amsinckia intermedia*)
gray fiddleneck (*Amsinckia retrosa*)
narrow-toothcombseed (*Pectocarya linearis*)

Brassicaceae (Mustard Family)
black mustard (**Brassica nigra*)
Sahara mustard (**Brassica tournefortii*)
shepherd's purse (**Capsella bursa-pastoris*)
summer mustard (**Hirschfeldia incana*)
shiny pepper grass (*Lepidium nitidum*)
wild radish (**Raphanus sativa*)
London rocket (**Sisymbrium irio*)
hare's ear cabbage (**Sisymbrium orientale*)

Caryophyllaceae (Pink Family)
windmill pink (**Silene gallica*)

Chenopodiaceae (Goosefoot Family)
serrate-leaved saltbush (**Atriplex suberecta*)
pitseed goosefoot (**Chenopodiumber landieri*)
nettle-leaved goosefoot (**Chenopodium murale*)
summer cypress (**Kochia scoparia*)
Russian thistle (**Salsola tragus*)

Convolvulaceae (Morning glory Family)
finger-leaved morning glory (*Calystegia macrostegia*)
small-flowered morning glory (†*Convolvulus simulans*)

Crassulaceae (Stone crop Family)
pygmy stone crop (*Crassula connata*)

Euphorbiaceae (Spurge Family)
dove weed (*Croton setiger)*
rattlesnake spurge (*Euphorbia albomarginata*)
petty spurge (**Euphorbia peplus*)

Fabaceae (Pea Family)
Acacia (**Acacia* sp.)
grab lotus (*Acmispon micranthus*)
miniature lupine (*Lupinus bicolor*)
bajada lupine (*Lupinus concinnus*)
arroyo lupine (*Lupinus succulentus*)
bur clover (**Medicago polymorpha*)
hairy vetch (**Vicia villosa*)

Geraniaceae (Geranium Family)
long-beakedfilaree (**Erodium botrys*)
red-stemmedfilaree (**Erodium cicutarium*)
white-stemmedfilaree (**Erodium moschatum*)

Juglandaceae (Walnut Family)
pecan (**Carya illinoinensis*)

Lamiaceae (Mint Family)
rosemary (**Rosmarinus officinalis*)
vinegar weed (*Trichostema lanceolatum*)

Lythraceae (Loosestrife Family)
pomegranate (**Punica granatum*)

Malvacea (Mallow Family)
cheeseweed (**Malva parviflora*)

Montiaceae (Miner's Lettuce Family)
red maids (*Calandrinia menziesii*)

Myrtaceae (Myrtle Family)
silver dollar gum (**Eucalyptus polyanthemos*)

Oleaceae (Olive Family)
shamel ash (**Fraxinus udehi*)
olive (**Olea europea*)

Oxalidaceae (Wood-Sorrel Family)
yellow sorrel (**Oxalis corniculata*)

Polygonaceae (Buckwheat Family)
interior California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*)
Persian knotweed (**Polygonum argycoleon*)
curly dock (**Rumex crispus*)

Primulaceae (Primrose Family)
scarlet pimpernel (**Anagallisarvensis*)

Solanaceae (Nightshade Family)
jimson weed (*Datura wrightii*)
tree tobacco (**Nicotiana glauca*)

MONOCOTYLEDONES, MONOCOTS

Arecaceae (Palm Family)
queen palm (**Syagrus romanzoffiana*)

Juncaceae (Rush Family)
toad rush (*Juncus bufonius*)

Poaceae (Grass Family)
wild oat (**Avena fatua*)
cultivated oat (**Avena sativa*)
rescue grass (**Bromus catharticus*)
ripgut brome (**Bromus diandrus*)
red brome (**Bromus madritensis ssp. rubens*)
foxtail fescue (**Festuca myuros*)
foxtail barley (**Hordeum murinum* ssp.*leporinum*)
goldentop (**Lamarkia aurea*)
schismus (**Schismus barbatus*)
wheat (**Triticum aestivum*)

Themidaceae (Brodiaea Family)
blue dicks (*Dichelostemma capitatum*)

Appendix C. Wildlife Species Observed

Birds
westernmeadowlark (*Sturnella neglecta*)
westernbluebird (*Sialia mexicana*)
northernmockingbird (*Mimus polyglottos*)
common raven (*Corvuscorax*)
westernkingbird (*Tyrannus verticalis*)
ash-throatedflycatcher (*Myiarchus cinerascens*)
Say's phoebe(*Sayornis saya*)
rockpigeon (*Columba livia*)
mourningdove (*Zenaida macroura*)
savannahsparrow (*Passerculus sandwichensis*)
larksparrow (*Chondestes grammacus*)
white-crowned sparrow (*Zonotrichia leucophrys*)
housefinch (*Carpodacus mexicanus*)
red-tailed hawk (*Buteo jamaicensis*)
American kestrel (*Falco sparverius*)

Mammals
Botta pocket gopher (*Thomomys bottae*) (sign)
Beechey ground squirrel (*Otospermophilus beecheyi*)
coyote(*Canis latrans*) (sign)

Reptiles
side-blotched lizard (*Uta stansburiana*)

Harness, Teresa

From: David Bramlet <davebramlet7@gmail.com>
Sent: Wednesday, May 24, 2017 6:44 PM
To: Harness, Teresa
Subject: HANS 2343/ PUP 931 / JPR 17-04-11-01 Temecula Valley Charter

The updated version of the Habitat Assessment for the Temecula Valley Charter School site, HANS 2343/ PUP 931 / JPR 17-04-11-01, has been uploaded to the County's ftp site.

David Bramlet
Consulting Biologist

Harness, Teresa

From: Harness, Teresa
Sent: Thursday, May 25, 2017 8:21 AM
To: 'pbrylski@gmail.com'
Subject: Planning Department has received a biological report

This email is to inform you that the Planning Department has received a biological report regarding the below referenced case:

Report Name: HABITAT ASSESSMENT TEMECULA VALLEY CHARTER SCHOOL
Report Date: 5/24/17
Case Number: PUP00931
Assessor's Parcel Number(s): 476-010-059, 476-010-013, 476-010-054
PDB Number: PDB06444 Revised 4-052417
Biologist Assigned: Given to biologist staff for review

Submit along with proper identification title of report and case number, assessor parcel numbers to be viewed in PDF format through:

The County of Riverside; RCIT Secure File Transfer
Server located at website: https://ftp.co.riverside.ca.us/
Public: Log in using the username of: rivcodocs
Password is: P@ssw0rd (the "0" is zero)
In search (it's labeled "Filter") box type in: Biology
Check the box: Find
It will bring up a folder: BB_Planning/Biology

- **It is important to submit directly to: BB_Planning/Biology**
- **If not then it cannot be confirmed that the report has been submitted correctly.**

Upload each biological report individual with a Title name of report.
(Use same title in the email subject line; one at a time: see below)
NO ZIP files or locked files accepted.

Select Green button to: "Add Files" from your computer; select your file(s) to be added, hit "Open."
Select Gray button (labeled "Start") to upload your report.
Hit the "Logout" button in the top right when completed with the upload.
Once report has been submitted then please notify me: THarness@RIVCO.org
Place the report's title and case number in the SUBJECT line of your email

****** Please call the RCIT-Helpdesk for any assistance (951) 955-9900.**

The PDB number will be given as the reference number and will be used to track the review status of the report. Should you have any questions, please do not hesitate to call or via email.

Thank you,

Teresa Harness, Office Assistant III

 *County of Riverside*
Planning Department
4080 Lemon Street, 12th Floor
Riverside, CA 92501
Telephone: (951) 955-6892
Fax: (951) 955-1811
Email: tharness@rivco.org
Planning Department Website: http://planning.rctlma.org/
County of Riverside California

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Harness, Teresa

From: Microsoft Outlook
To: pbrylski@gmail.com
Sent: Thursday, May 25, 2017 8:21 AM
Subject: Relayed: Planning Department has received a biological report

Delivery to these recipients or groups is complete, but no delivery notification was sent by the destination server:

pbrylski@gmail.com (pbrylski@gmail.com)

Subject: Planning Department has received a biological report

Appendix

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Appendix C2 Fairy Shrimp Survey

SUMMITWEST ENVIRONMENTAL, INC
2683 NW Rainbow Ridge Dr
Bend OR 97703
(858) 220-5674
SummitWestEnv.com

Collection and Processing of Dry Samples for the Presence of Fairy Shrimp Cysts and Culturing of Cysts for Species Determination for Species Identification at Temecula Charter School Site.

29 May, 2017

Introduction

Chuck Black, 10(a)(1)(A) permit number TE835549-7, of Ecological Restoration Service, San Diego, CA, was contracted in April 2017 by Chezzie Brungraber of SummitWest Environmental, Inc., Bend Oregon for assistance with collection and processing of dry samples for the determination of the presence of fairy shrimp cysts, and for culturing of *Branchinecta* cysts for identification to the species level of any cysts found for dry samples from 2 road ruts on the Temecula Charter School site (Figures 1 and 2).

Project Description

The Temecula Charter School parcel has UTM coordinates for the approximate center of the site as 11S 0491121mE x 3720624mN (Figures 1, 2). The parcel is located within criteria cell 5275 (Southwest Area Plan, French Valley-Lower Sedco Hills subunit) of the western Riverside Multi-Species Habitat Conservation Plan (MSHCP; County of Riverside 2016b). Because the project site is found within a criteria cell, this report includes a habitat assessment for species and sensitive habitats identified by the MSHCP and an MSHCP Consistency Analysis (RCA 2007a, 2007b).

During a 2016-17 habitat assessment of the site by Phillip Brylski and David Bramlet, observed was ponding in two road ruts, approximately 28 sq ft (RR1) and approximately 7 sf (RR2) in size.

The ponded road ruts were assessed for meeting the inundation criteria for fairy shrimp habitat (USFWS 2015). It is likely that these road ruts filled on February 27, 207 during an unusual rain event (Weather Currents 2017). The initial observations were conducted three days following that event (March 2, 2017). The road ruts within the Flossie Rd ROW were dry within 10 days of when the road ruts were assumed to have ponded (observed on March 10, 2017) and eight days following the first survey. These road ruts appeared to have actually dried within eight days, as observed by the wildlife biologist. Therefore, these road ruts would not be considered

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to have ponded for a sufficient duration to provide suitable habitat for listed fairy shrimp species. No ponding was observed on the two parcels that form the project site. These recent survey guidelines note a seven or ten day period for sampling period, which is assumed to represent the life cycle of some fairy shrimp species (USFWS 2015).

In a review of the habitat assessment plan, the Riverside County Environmental Programs Department and the Regional Conservation Authority (RCA) for Joint Project Review stated that the casual observations of ponding were not sufficient for fairy shrimp presence sampling, and that a wet or dry season survey needed to be performed on the basins. The current request represents a dry season sampling to satisfy these requirements.

Methods

Sample Collection

After receiving a notice of permission to proceed by the Service, Chuck Black collected samples on May 28, 2017. Ruts were located by gps locations and the presence of previously placed pin flags by the ruts. Estimates of size during ponding at the time of the habitat assessment gave 28 square feet for Road Rut 1 and 4 square feet for Road Rut 2. Unvegetated area of the ruts at time of sample collections were much smaller. Ten approximately 50 ml samples were collected along a single transect through each rut were collected.

No obligate or facultative wetland plants were noted in ruts, and there was a dense stand of non-native *Bromus diandrus* on the site, including in most of the rut areas.

Soil Processing for Cyst Presence

Samples were processed by Chuck Black of Ecological Restoration Service, who is authorized by the U.S. fish and Wildlife Service to process dry samples for the presence of fairy shrimp cysts and to culture cysts to identify to species level as special conditions of his 10(a)(1)(A) permit. The bulk samples were divided and hydrated for approximately 1-2 hours in tap water, then washed through a set of sieves. Material passing through a Number 45 (.0139") USA Standard Testing Sieve, A.S.T.M.E.-11 specification and caught on a Number 70 (.0083") Sieve was rinsed into a container with approximately 50 ml of a saturated brine solution to float organic material, including fairy shrimp cysts. The material floating on the brine was decanted onto a paper filter on a filter funnel, and water was removed through the filter paper by vacuum suction. The material left on the paper was examined under a 6.3-570x power Olympus SZX9 Zoom Stereo Microscope. Distinctive fairy shrimp cysts, if present, were individually counted (if less than approximately 50) or estimated (for larger numbers) by examining ¼ or ½ subsections of the filter and multiplying the subset by the appropriate factor. The presences and numbers of ostracod shells and cladoceran ephippia were also noted in samples.

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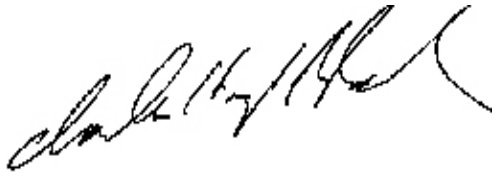
Results

No *Branchinecta* or *Streptochepalus* cysts were present in any of the samples from either rut. No ostracod shells or cladoceran ephippia were present in any of the samples.

I certify that the information in this survey report and attached exhibits fully and accurately represent my work.



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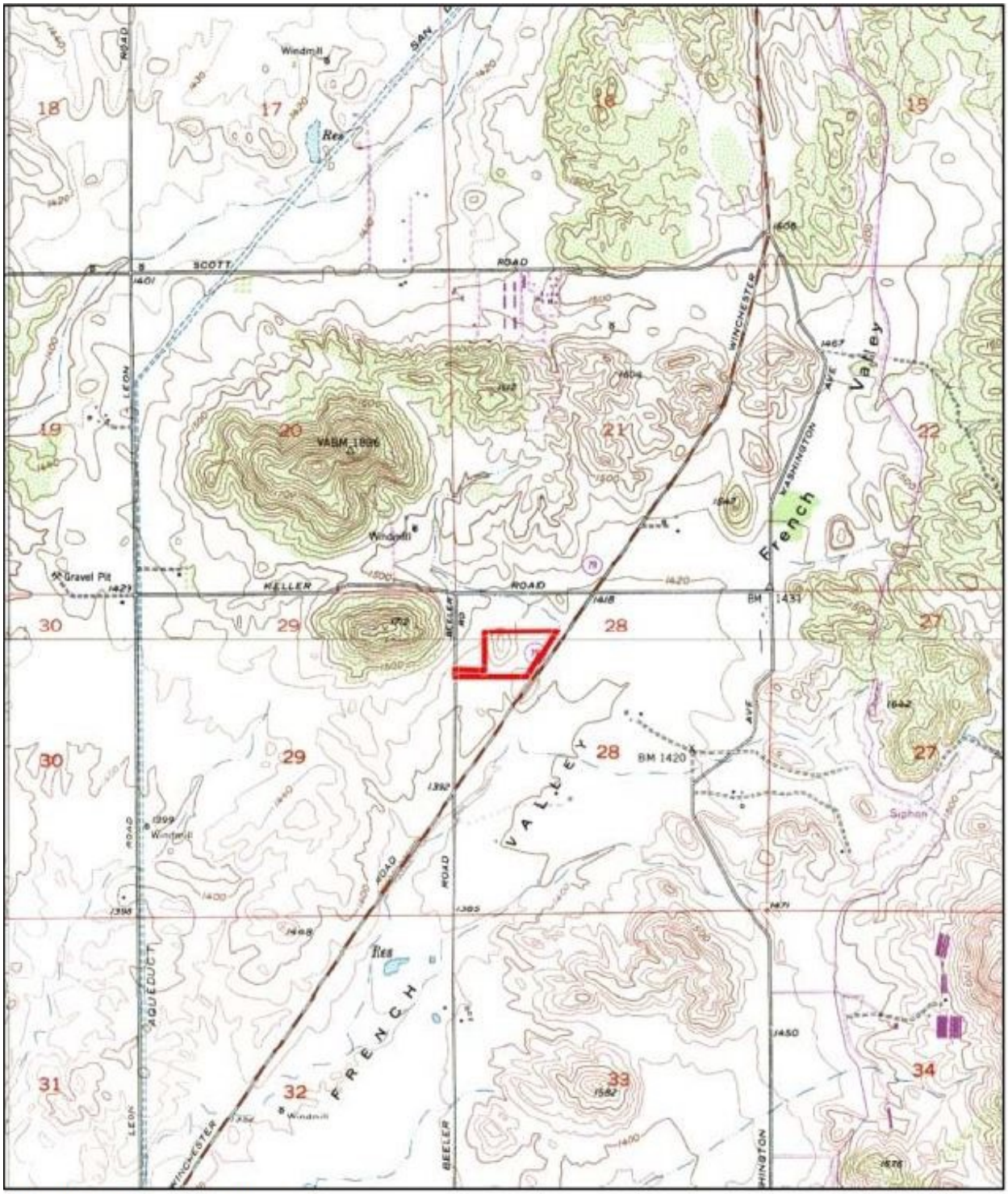

Figure 1. Topographic map

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Figure 2 – Location of the road ruts (RR) at the Temecula Valley Charter School site. RR1: 33.372503N, 117.0060046W, RR2: 33.3722513 N, 117.055343W

Appendix

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Appendix D Geotechnical Investigation

GEOTECHNICAL INVESTIGATION
PROPOSED CHARTER SCHOOL SITE
34155 WINCHESTER ROAD
FRENCH VALLEY AREA
RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR:

TEMECULA VALLEY CHARTER SCHOOL
C/O Hansberger & Klein, PLC
P.O. Box 1352
Blue Jay, California 92317-1352

PREPARED BY:

INLAND FOUNDATION ENGINEERING, INC.
1310 South Santa Fe Avenue
San Jacinto, California 92583

September 9, 2016
Project No. T238-001

INLAND FOUNDATION ENGINEERING, INC.
Consulting Geotechnical Engineers and Geologists
P.O. Box 937, San Jacinto, CA 92581

September 9, 2016
Project No. T238-001

TEMECULA VALLEY CHARTER SCHOOL
C/o Hansberger & Klein, PLC
P.O. Box 1352
Blue Jay, California 92317-1352

Attention: Richard J. Hansberger

Re: Geotechnical Investigation
Proposed Charter School Site
34155 Winchester Road
French Valley Area, Riverside County, California
APN's 476-010-013 & -059

Dear Mr. Hansberger:

We are pleased to submit this geotechnical investigation report conducted for the referenced project. The site is located west of and adjacent to Winchester Road, approximately 625 feet south of Keller Road in the French Valley area of Riverside County, California.

It is our opinion that the proposed development is feasible from a geotechnical engineering standpoint. Our report includes design recommendations along with the field and laboratory data. We have also included recommendations for site grading.

We appreciate the opportunity of being of service to you on this project. If there are any questions, please contact our office.

Respectfully,
INLAND FOUNDATION ENGINEERING, INC.

Daniel R. Lind, CEG
Principal Geologist

Allen D. Evans, GE
Principal

DRL:ADE:es
Distribution: Addressee (3)

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INTRODUCTION

This report presents the results of the geotechnical investigation/geoseismic evaluation conducted at the site of the proposed Temecula Valley Charter School. The site is located west of and adjacent to Winchester Road, approximately 625 feet south of Keller Road, in the French Valley area of Riverside County, California. The Assessor's Parcel Numbers for the property are 476-010-013 & -059. The following references were provided for our use during this study.

- TVCS Site Plan and Floor Plan, dated July 6, 2016, prepared by WLC Architects.
- TVCS Aerial, dated June 17, 2016, prepared by WLC Architects.
- ALTA/NSPS Land Title Survey, 34155 Winchester Road, Winchester, Riverside County, California, dated June 14, 2016, prepared by O.K.O. Engineering, Inc.
- ALTA/NSPS Land Title Survey (with Topographic Survey), 34155 Winchester Road, Winchester, Riverside County, California, dated June 28, 2016, prepared by O.K.O. Engineering, Inc.

This report provides preliminary design parameters that may be applied to the proposed development on the site.

SCOPE OF SERVICES

The purpose of this study was to provide geotechnical parameters for design and construction of the proposed project. The scope of the geotechnical services included:

- *A review of the general geologic and subsurface conditions at the project site.*
- *An evaluation of the engineering and geologic data collected for the project site.*
- *Preparation of this report providing preliminary geotechnical engineering conclusions and recommendations for design and construction.*

The tasks performed to achieve these objectives included:

- *Collection and review of geologic data relative to the site.*
- *Subsurface exploration to evaluate the nature and stratigraphy of the subsurface soils and to obtain representative samples for laboratory testing.*

- *A visual reconnaissance of the site and surrounding area to ascertain the presence of unstable or adverse geologic conditions.*

- *Laboratory testing of representative samples to evaluate the classification and engineering properties of the soils.*

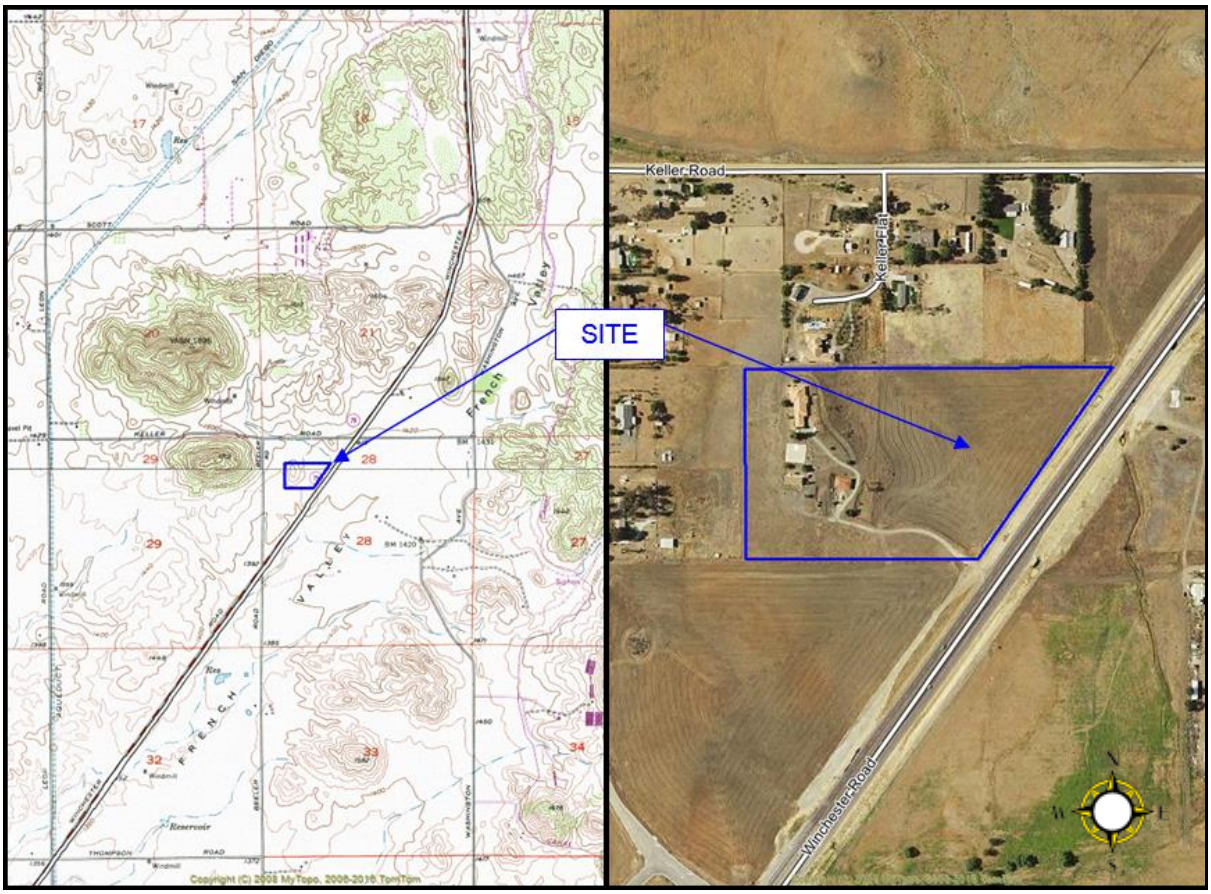
- *Analysis of the data collected and the preparation of this report with preliminary geotechnical engineering conclusions and recommendations.*

Evaluation of hazardous waste was not within the scope of services provided. Evaluation of seismic hazards was based on field mapping, literature review and limited subsurface exploration. Because the site is not located in a defined active fault zone, a detailed review in this regard was not conducted.

PROJECT AND SITE DESCRIPTION

The site is located in the northwesterly portion of Section 28, Township 6 South, Range 2 West, S.B.B.&M. The site is located west of and adjacent to Winchester Road, approximately 625 feet south of Keller Road in the French Valley area of Riverside County, California. The Assessor's Parcel Numbers for the property are 476-010-013 & -059. The project site occupies two parcels on approximately 14.6 acres. Most of the proposed charter school campus will be built on the easterly parcel (APN 476-010-059) that is currently vacant. The westerly parcel (APN 476-010-013) consists of a knoll that has been developed with single family residence, mobile home, and other outbuildings. The location of the project site is shown on Figure 1 below.

Figure 1: U.S.G.S. Topographic Maps, Winchester & Bachelor Mt. 7.5' Quadrangles and Aerial Photograph (2014)



At the present time, the proposed school site is vacant. At the time of our field investigation the site had been recently disced. The site is bounded to the east by Winchester Road (State Route 79), to the north and west by rural property, and to the south by vacant land. A borrow ditch is present adjacent to the site along Winchester Road. Two concrete drainage structures are present beneath Winchester Road, near the northerly and southerly portions of the site.

The topography is slightly sloping with a gradient of approxiately 10 percent to the east-southeast. Based on the provided toographic map, elevations across the charter school site range from approximately 1,430 feet above mean sea level (msl) beneath the northwesterly corner of the site to approximately 1,410 feet msl near the southeasterly portion of the site. A shallow and broad drainage swale is present through the center-southern portion of the site, which drains toward the southerly culvert beneath Winchester Road. A review of historical aerial photographs indicates that this drainage swale was more pronounced in the past.

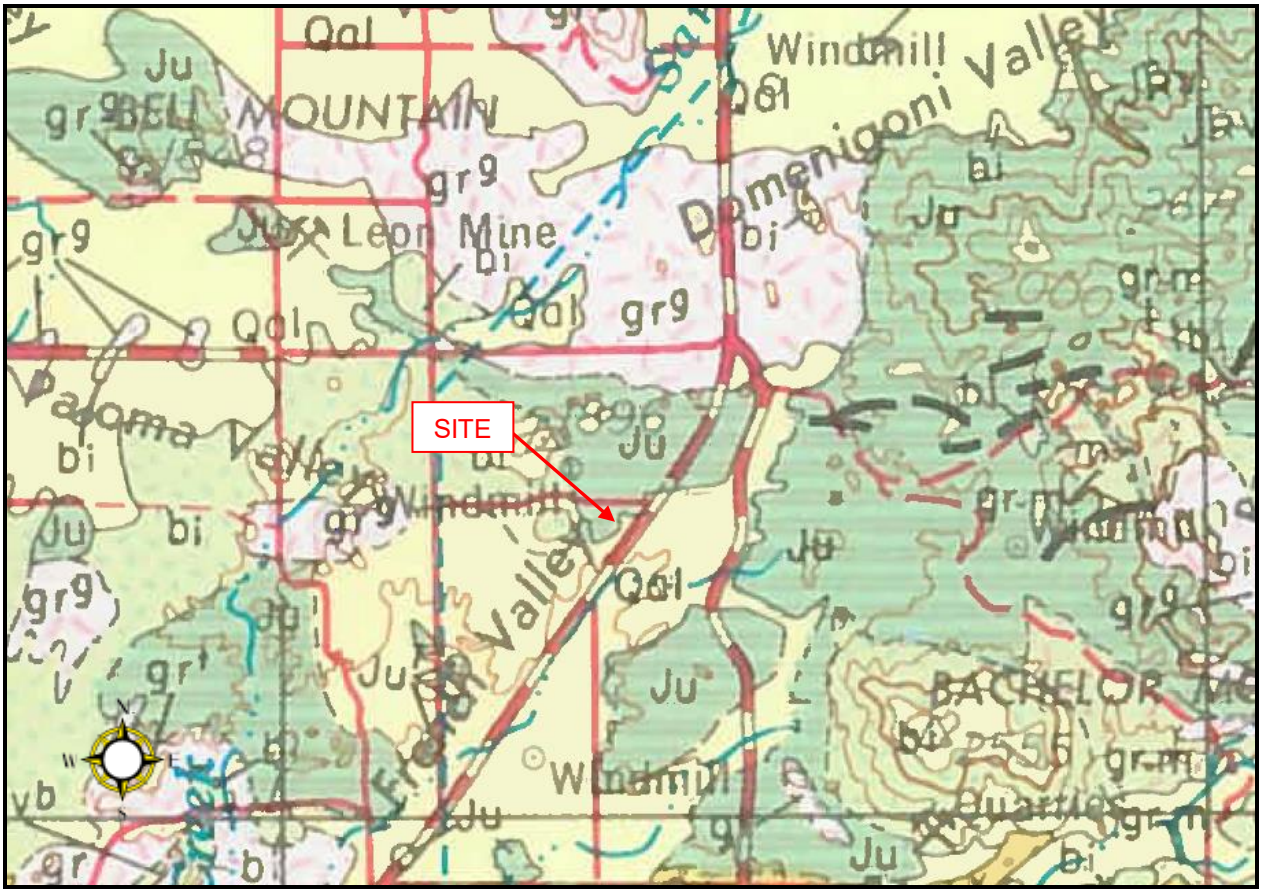
Based on the provided site plan and discussions with the architect, we understand that the proposed construction will consist of six structures located around a central courtyard. The buildings will be single-story wood-framed structures ranging in size from approximately 2,500 to 9,400 square feet. The total cumulative area of the campus buildings will be 44,600 GSF. A paved parking area is planned on the easterly portion of the site. A fire lane is planned around the building complex. We understand that a stormwater retention system is tentatively planned on the easterly portion of the site. Grading is expected to consist of cuts and fills of less than five feet, exclusive of remedial over-excavation as recommended in this report.

GEOLOGIC SETTING

Regional Geology: The subject site is situated within a natural geomorphic province in southwestern California known as the Peninsular Ranges, which is characterized by steep, elongated ranges and valleys that trend northwesterly. This geomorphic province encompasses an area that extends 125 miles, from the Transverse Ranges and the Los Angeles Basin, south to the Mexican border, and beyond another 795 miles to the tip of Baja California (Norris & Webb, 1990; Harden, 1998). This province is believed to have originated as a thick accumulation of predominantly marine sedimentary and volcanic rocks during the late Paleozoic and early Mesozoic. Following this accumulation, in mid-Cretaceous time, the province underwent a pronounced episode of mountain building. The accumulated rocks were then complexly metamorphosed and intruded by igneous rocks, known locally as the Southern California Batholith. A period of erosion followed the mountain building, and during the late Cretaceous and Cenozoic time, sedimentary and subordinate volcanic rocks were deposited upon the eroded surfaces of the batholithic and pre-batholithic rocks.

Figure 2 below shows a portion of the C.D.M.G. Geologic Map of California, Santa Ana Sheet, (Scale 1:250,000), Southern California (Rogers, 1965) depicting the approximate location of the project site.

Figure 2: **C.D.M.G., 1966, Geologic Map of California, Santa Ana Sheet, Scale 1:250,000.**

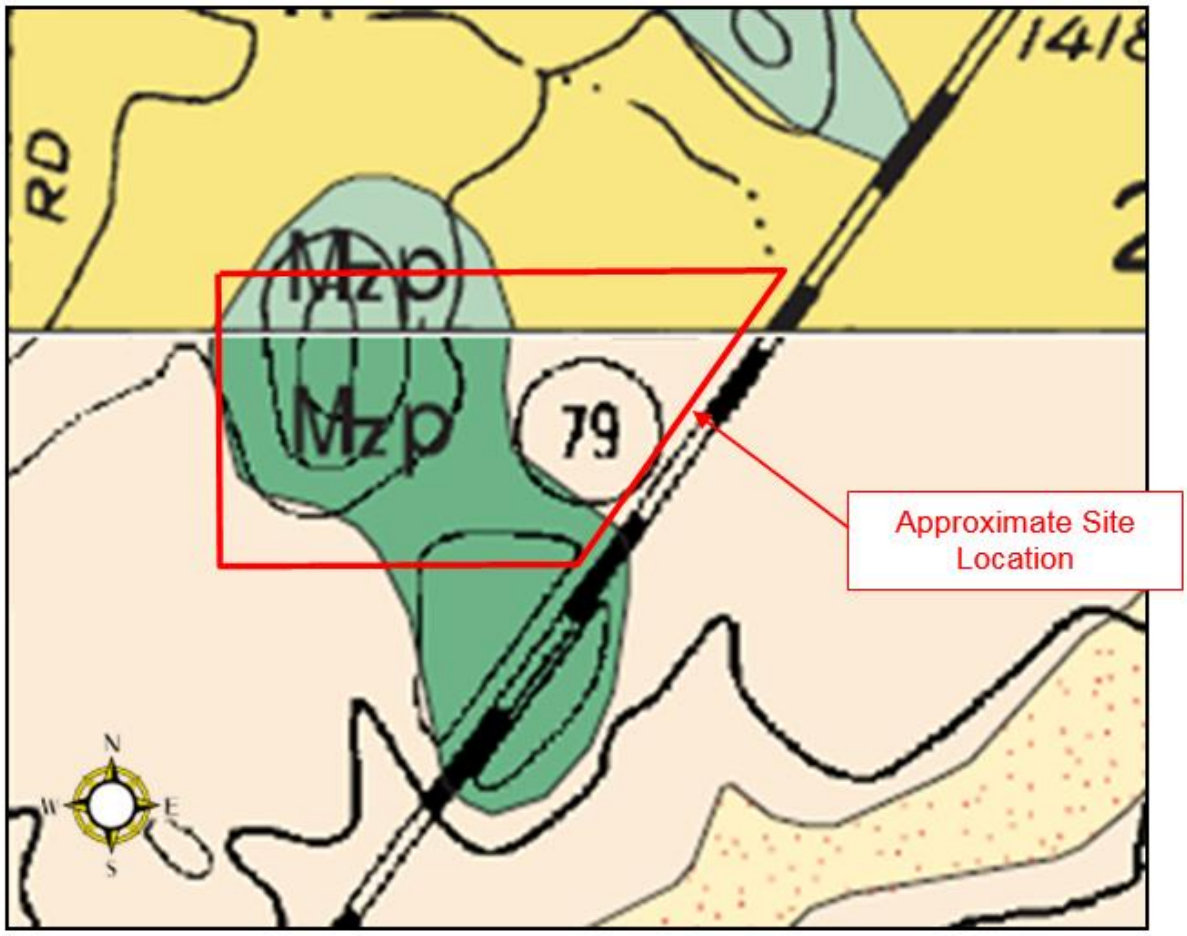


Local Geology: More specifically, the site is situated along the central portion of the Perris Block, an eroded mass of Cretaceous and older crystalline rock. Thin sedimentary and volcanic units mantle the bedrock in a few places with alluvial deposits filling in the lower valley areas. The Perris Block is a structurally stable, internally unfaulted mass of crustal rocks bounded on the west by the Elsinore-Chino fault zones, on the east by the San Jacinto fault zone, and on the north by the Cucamonga fault zone (Woodford, et al., 1971). On the south, the Perris Block is bounded by a series of sedimentary basins that lie between Temecula and Anza (Morton and Matti, 1989).

According to Morton & Kennedy (2003), the site is underlain by very old (middle to early Pleistocene age) alluvial valley deposits and Mesozoic age metamorphic bedrock (phyllite). The alluvial soils are described as well-indurated, reddish-brown, gravel, sand, silt and clay-bearing alluvium (map symbol Qvov). These soils are mapped on the northeasterly portion of the school site. The phyllite bedrock (map symbol Mzp) is mapped across the westerly and southeasterly portion of the school site.

Figure 3 below presents combined portions of the U.S.G.S. Preliminary Geologic Map of the Winchester 7.5' Quadrangle (Morton, 2003) and the Geologic Map of the Bachelor Mt. 7.5' Quadrangle (Morton & Kennedy, 2003) depicting the mapped geologic units in the vicinity of the site.

Figure 3: U.S.G.S. Geologic Maps, Winchester 7.5' Quadrangle and Bachelor Mt. 7.5' Quadrangle (2003)



Qvov — **Very old alluvial valley deposits (middle to early Pleistocene)**—Fluvial sediments deposited on broad canyon floors. Consists of moderately to well-indurated, reddish-brown, mostly very dissected gravel, sand, silt, and clay-bearing alluvium. In places, includes thin, discontinuous alluvial deposits of Holocene age

Mzp — **Phyllite (Mesozoic)**—Fissle black phyllite. Commonly has sheen produced by very fine-grained white mica on s-surface; locally contains small elongate prisms of fine-grained white mica, which may be pseudomorphs after chiastolite

Groundwater: Groundwater was encountered within our exploratory boring B-08 at a depth of approximately 30 feet below the existing ground surface. Groundwater information pertinent to the alignment was derived from published California Department of Water Resources (DWR) historical groundwater level data and observation of groundwater conditions in borings drilled during this investigation.

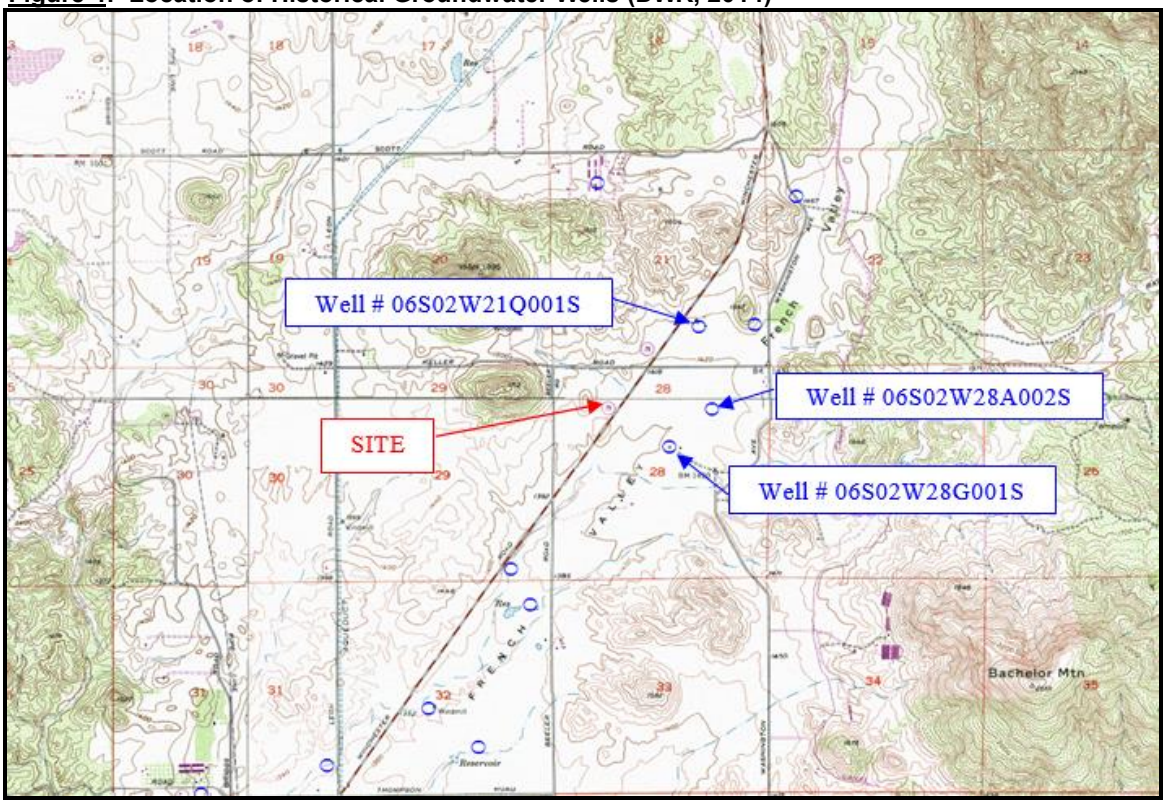
Several historical groundwater records were located in the DWR database for wells in the vicinity of the project site. The State Well Number, depth to ground-water, date monitored, and coordinate locations of each of these wells are presented in Table 1 below:

Table 1: Historical Groundwater Data, Department of Water Resources

State Well No.	Reported Depth to Groundwater (ft.)	Date Monitored	Coordinate Location (NAD27)
06S02W21Q001S	21	1/1/68	117.0886/33.6298
06S02W28A002S	13	1/1/68	117.0875/33.6242
06S02W28G001S	10	1/1/68	117.0909/33.6217

The approximate locations of the wells reported by DWR are presented on the following U.S.G.S. topographic map for reference (Figure 4). It should be noted that the reported groundwater depths in the vicinity may not represent current conditions.

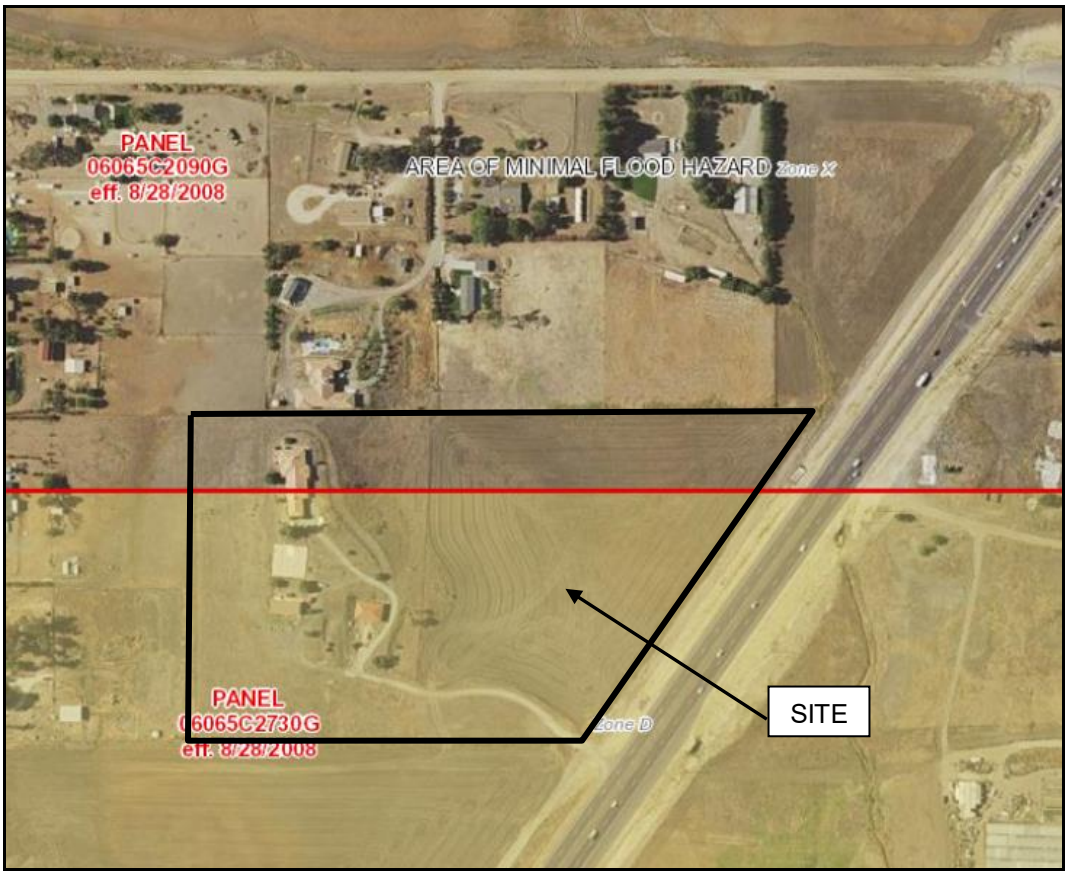
Figure 4: Location of Historical Groundwater Wells (DWR, 2014)



Surface Water: No indications of surface water (ponding, poor drainage, etc.) were observed on the site during the time of this study. Surface water at this site is controlled by the site topography. A review of the U.S.G.S. topographic map for this site indicates that the site drains to the east-southeast.

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) website (FEMA, 2016), indicates that no specific current FIRM maps are printed for the subject property. The northerly portion of the property is located within Panel 06065C2090G, dated August 28, 2008. This panel indicates that the northerly portion of the project site is located in an area designated as "Zone X" described as "Areas of Minimal Flood Hazard". The southerly portion of the site lies within Panel 06065C2730G, labeled as Zone D. The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. The designation of Zone D is also used when a community incorporates portions of another community's area where no map has been prepared (FEMA, 2013). Figure 5 below shows portions of the referenced panels.

Figure 5: FEMA Panel Nos. 06065C2090G and 06065C2730G, FEMA, 2008



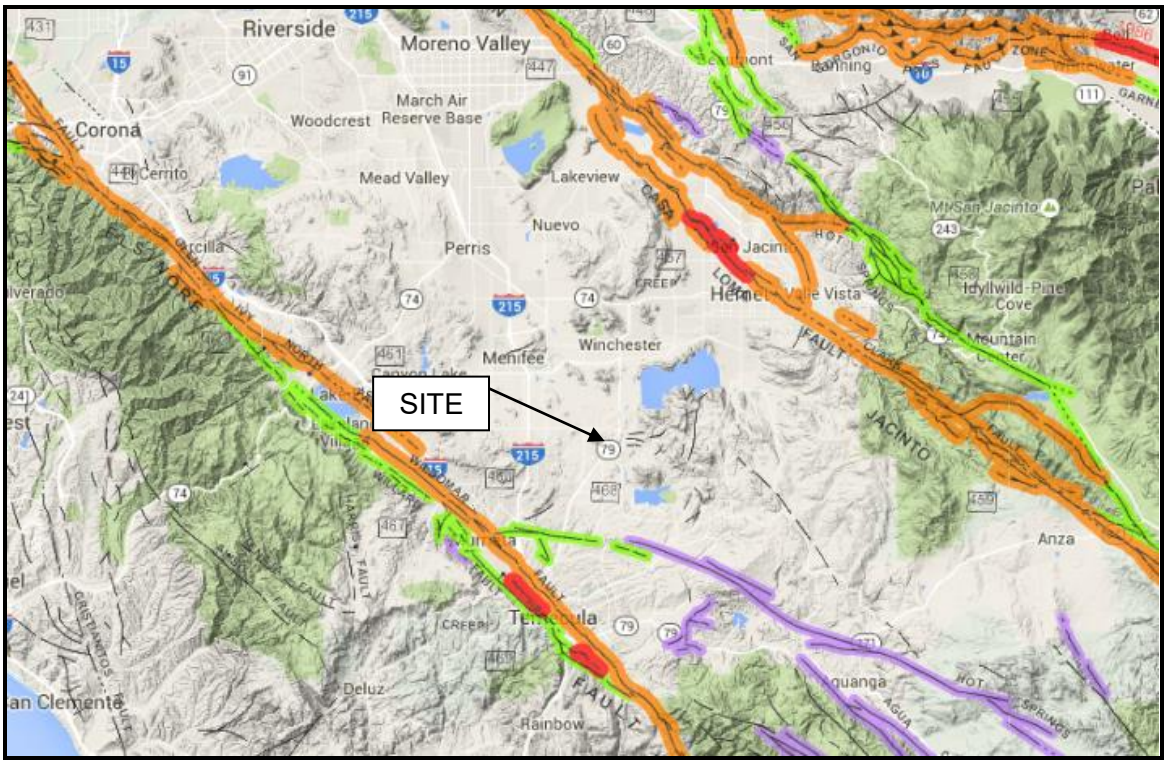
Faulting: There are at least 38 major late Quaternary active/potentially active faults that are within a 100-kilometer radius of the site (Blake, 2000). Of these, there are no faults known to traverse the site, based on published literature, nor is there any photogeologic or surficial geomorphic evidence suggestive of faulting on the site. In addition, the site is not located within a State of California "Alquist-Priolo Earthquake Fault Zone" for fault rupture hazard (Hart and Bryant, 2007) or within a mapped County of Riverside fault zone.

The nearest known active fault is the Temecula segment of the Elsinore Fault Zone, which is approximately 62 kilometers in length and located approximately 12.0 kilometers to the southwest of the project site. This fault is a right-lateral, strike-slip fault capable of producing an earthquake with an estimated maximum moment magnitude of M_W 7.0, and has an associated slip-rate of 5 mm/yr. (U.S.G.S., 2008).

The Elsinore fault zone is a major dextral shear system, parallel to the southern San Andreas fault that accommodates about 5 mm/yr. of the Pacific-North American Plate boundary slip. The northern elements of the fault zone, the Chino and Whittier faults, bound the Puente Hills, an uplifted block of Tertiary sediments. The Glen Ivy section forms the northeast boundary of the Santa Ana Mountains, and, together with the Temecula section, forms the Elsinore trough (Treiman, 1998). Other known regional active faults that could affect the site include the San Jacinto fault (San Jacinto, Anza, and San Bernardino segments) and San Andreas fault.

Figure 6 presents a portion of the 2010 Fault Activity Map of California (CGS, 2010) depicting the site location and mapped faults in the vicinity. This map indicates that no active faults are present on the site, or trending toward the site.

Figure 6: 2010 Fault Activity Map of California (CGS, 2010)



According to the U.S.G.S. 2008 National Seismic Hazard Maps - Source Parameters (USGS, 2008), the major faults influencing the site, distances and maximum earthquake magnitudes are presented in Table 2.

Table 2: Fault Zone, Distances and Maximum Earthquake Magnitudes

Fault Zone	Approximate Distance (km)	Earthquake Magnitude (m_w)	Slip Rate (mm/yr)
Elsinore-Temecula	12.0	7.0	5
San Jacinto-San Jacinto Valley	13.0	7.0	18
San Jacinto-Anza	13.0	7.2	9
Elsinore-Glen Ivy	14.5	6.8	5

Our evaluation of the potential for surface fault rupture at this site included an examination of two non-stereo and ten stereo pairs of vertical black and white aerial photographs dating from 1949 to 2014 (see References for a listing) to aid in assessing the geologic and geomorphic characteristics with respect to the site and vicinity. The photogeologic analysis did not reveal indicators suggestive of active fault-related features. This included the lack of photolineations and/or no consistent tonal variations across the site, or trending toward the site.

Our review indicates that no documented active faults traverse toward the subject site, based on published literature. No surficial indications or geomorphic features were observed within the aerial photographs or field reconnaissance that are suggestive of active faulting.

Seismic Parameters: The site coordinates (NAD 83) are 33.6247°N / -117.0967°W. On the bases of the subsurface conditions and local fault characteristics, the 2013 California Building Code provides the following seismic design parameters as presented in Table 3.

Table 3: 2013 CBC Seismic Design Parameters

Seismic Parameter	2013 CBC / ASCE 7-10 Reference	Value
Site Class	- - - / Table 20.3-1	D
$\mathbf{S_s}$ - Mapped Spectral Acceleration for Short Period	Fig. 1613.3.1(1) / Figure 22-1	1.500
$\mathbf{S_1}$ - Mapped Spectral Acceleration for 1-sec Period	Fig. 1613.3.1(2) / Figure 22-2	0.600
$\mathbf{F_a}$ – Short Period Site Coefficient	Table 1613.3.3(1) / Table 11.4-1	1.0
$\mathbf{F_V}$ – Long Period Site Coefficient	Table 1613.3.3(2) / Table 11.4-2	1.5
$\mathbf{S_{MS}}$ – Maximum Considered Earthquake Spectral Response Acceleration, 5% damped, 0.2-sec period, adjusted for Site Class	Eq. 16-37 / Eq. 11.4-1	1.500
$\mathbf{S_{M1}}$ - Maximum Considered Earthquake Spectral Response Acceleration, 5% damped, 1-sec period, adjusted for Site Class	Eq. 16-38 / Eq. 11.4-2	0.900
$\mathbf{S_{DS}}$ - Design Earthquake Spectral Response Acceleration, 5% damped, 0.2-sec period	Eq. 16-39 / Eq. 11.4-3	1.000
$\mathbf{S_{D1}}$ - Design Earthquake Spectral Response Acceleration, 5% damped, 1-sec period	Eq. 16-40 / Eq. 11.4-4	0.600
$\mathbf{MCE_G}$ **PGA** – Maximum Considered Earthquake Geometric Mean for Site Class B	- - - / Figure 22-7	0.503
$\mathbf{PGA_M}$ – MCE_GPGA adjusted for Site Class	- - - / Eq. 11.8-1	0.503g
Seismic Design Category	Sect. 1613A.3.5	D

It is recommended that all structures be designed to at least meet the current California Building Code provisions in the latest CBC edition; however, it should be noted that the building code is intended as a minimum design condition and is often the maximum level to which structures are designed. Structures that are built to minimum code requirements are designed to remain standing after an earthquake in order for occupants to safely evacuate, but then may have to ultimately be demolished (Larson and Slosson, 1992).

It is the responsibility of both the property owner and project structural engineer to determine the risk factors with respect to using CBC minimum design values for the subject project. The previously-outlined CBC seismic classifications and data have been provided for use by the project structural engineer, to aid in evaluating design criteria, if needed. This information should be used to help select the appropriate seismic parameters, as outlined in the California Building Code (CBC, 2013). In addition, a site-specific seismic shear-wave study could also be performed to properly evaluate the soil profile type for site classification and seismic design purposes.

Secondary Seismic Hazards: The primary geologic hazard affecting the project is that of ground shaking. Secondary permanent or transient seismic hazards generally associated with severe ground shaking during an earthquake include, but are not necessarily limited to; ground rupture, liquefaction, seiches or tsunamis, landsliding, rockfalls, and seismically-induced settlement. These are discussed below:

Ground Rupture: Ground rupture is generally considered most likely to occur along pre-existing faults. Since there are no faults that are known to traverse the site, the potential for ground rupture is considered to be low.

Liquefaction and Seismically-Induced Settlement: In general, liquefaction is a phenomenon that occurs where there is a loss of strength or stiffness in the soils that can result in the settlement of buildings, ground failure, or other hazards. The main factors contributing to this phenomenon are: 1) cohesionless, granular soils having relatively low density (usually of Holocene age); 2) shallow ground water (generally less than 50 feet); and 3) moderate to high seismic ground shaking.

Due to the presence of medium dense to dense older alluvial soils underlain by relatively shallow metamorphic bedrock at the site (refer to SUBSURFACE CONDITIONS section), the results of our analysis indicate that the potential for liquefaction and seismically induced settlement is negligible.

Seiches/Tsunamis: A seiche is a standing wave in an enclosed or partially enclosed body of water. In order for a seiche to form, the body of water needs to be at least partially bounded, allowing the formation of the standing wave. Tsunamis are very large ocean waves that are caused by an underwater earth-quake or volcanic eruption, often causing extreme destruction when they strike land.

There are no bodies of water on or adjacent to the project site. Based on the distance to large, open bodies of water and the elevation of the site with respect to sea level, it is our opinion that the potential of seiches/tsunamis does not present a hazard to this project.

Landsliding: Due to the relatively low-lying relief of the site and adjacent areas, the potential for landsliding due to seismic shaking is considered very low.

Rockfalls: Since no large rock outcrops are present on or adjacent to the site, the possibility of rockfalls during seismic shaking is nil.

Debris Flows: Debris flows are composed of a slurry-like mass of liquefied debris (ranging up to boulder size) that moves downhill under the force of gravity.

Such slurries are dense enough to support very large particles but not solid enough to resist flowing downhill. Debris flows are most common in steep mountain canyons when a mass of mud and debris becomes saturated during a heavy rainstorm and suddenly begins to flow down the canyons (Prothero & Schwab, 1996). Based on the location of the site and the relatively planar topography of the property up-gradient of site, it is our opinion that the hazard of debris flow should be considered low.

Erosion: No indication of wind or water surface erosion was observed on the site or adjacent properties at the time of our study. It is our opinion that the hazard of erosion at this site should be considered low.

Other Geologic Hazards: There are other geologic hazards not necessarily associated with seismic activity that occur statewide. These hazards include; natural hazardous materials (methane gas, hydrogen-sulfide gas, tar seeps); Radon-222 Gas; regional subsidence, and naturally occurring asbestos. Of these hazards, there are none that appear to impact the site.

ENGINEERING GEOLOGY REVIEW CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

1. Earth Materials

Locally as mapped, the site is shown to be underlain by very old (middle to early Pleistocene) age alluvial valley deposits and Mesozoic age metamorphic bedrock (phyllite).

Exploratory borings conducted by our firm indicate that the site is underlain by a veneer of alluvial deposits overlying metamorphic bedrock (fissile phyllite). The alluvial deposits encountered range in thickness from approximately one (1) to 10 feet across the site. The soils are predominately comprised of fine-grained silty

clayey sand, clayey sand, and sandy clay in a generally loose (soft) to hard condition, with varying degrees of cementation. The upper foot (approximately) of the disced surficial soils are very loose. The underlying bedrock (phyllite) is highly to moderately weathered and generally in a hard condition. Some fracturing of the bedrock was observed.

2. Faulting

No active faults are known to traverse the site. In addition, the site is not located within a designated Alquist-Priolo Earthquake Fault Zone for fault rupture hazards. The nearest "known" active fault is the Temecula segment of the Elsinore Fault Zone, located approximately 12.0 kilometers to the southwest of the project site.

3. Seismicity

The primary geologic hazard that exists at the site is that of ground shaking. Several factors determine the severity of ground shaking at a given location, such as size of earthquake, length of fault rupture (if any), depth of hypocenter, type of faulting (dip slip/strike slip), directional attenuation, amplification, earth materials, and others. Due to the location of the site with respect to regional faulting and the recorded historical seismic activity, moderate to severe ground shaking should be anticipated during the life of the proposed facility.

4. Groundwater

Groundwater was encountered within our exploratory boring B-08 at a depth of approximately 30 feet below the existing ground surface. Groundwater data reviewed during this study revealed the depth to historical high groundwater levels in the vicinity of the site is less than 20 feet beneath the existing ground surface. We have estimated a historical high groundwater level of 15 feet beneath the existing ground surface.

5. Secondary Seismic Hazards

There do not appear to be any permanent or transient secondary seismic hazards that would affect the proposed school.

***Recommendations*:**

1. Following are the seismic design parameters determined in accordance with the California Building Code and ASCE-7:

Parameter	Value
S_{DS}	1.00
S_{D1}	0.60
S_{MS}	1.50
S_{M1}	0.90
Seismic Design Category	D

2. It is recommended that all structures be designed to at least meet the current California Building Code provisions in the latest CBC edition (2013); however, it should be noted that the building code is described as a minimum design condition and is often the maximum level to which structures are designed. Structures that are built to minimum code requirements are designed to remain standing after an earthquake in order for occupants to safely evacuate, but then may have to ultimately be demolished (Larson and Slosson, 1992). It is the responsibility of both the property owner and project structural engineer to determine the risk factors with respect to using CBC minimum design values for the facility.

SUBSURFACE CONDITIONS

The results of our field and laboratory exploration and testing indicate that the site is underlain by a veneer of alluvial deposits overlying metamorphic bedrock (fissile phyllite). The alluvial deposits encountered range in thickness from approximately one (1) to 10 feet across the site. The soils are predominately comprised of fine-grained silty clayey sand (SC-SM), clayey sand (SC), and sandy clay (CL) in a generally loose/soft to hard condition, with varying degrees of cementation. The upper foot (approximately) of the disced surficial soil is very loose. The underlying bedrock (phyllite) is highly to moderately weathered and generally in a hard condition.

A typical profile is indicated below (Figure 7)