

APPENDIX E

**REGIONAL EMISSIONS ANALYSIS AND PARKING
LOT ANALYSIS**

Regional Emissions Calculations

Vehicle Emissions	Value	CO	ROC	NOx	PM10	SO2	PM2.5	CO2
Emission factor (g/mi)		4.232	0.088	0.25	0.028	0.005	0.026	543.906
VMT reduced per year (from ridership data) (miles)	34206640							
Daily VMT reduced (52 wks/yr; 5 days/wk)	131564							
Daily emissions - EF x Daily VMT (grams/day)		556779	11578	32891	3684	658	3421	71558449
Daily emissions - (lbs/day) 1 lb = 453.6 grams		1227	26	73	8	1	8	157757

Locomotive Emissions	Value	CO	ROC	NOx	PM10	SO2	PM2.5	CO2
Tier 2 F59PHI Diesel emission factor (g/bhp-hr), (g/gal for CO2 and SO2)		1.28	0.27378	4.95	0.18	0.0945	0.1746	10217
Engine conversion factor (bhp-hr/gal)	20.8							
Trips per day between South Perris & LA (trips)	12							
Miles per trip between South Perris & LA (miles)	84							
Diesel Fuel Efficiency (miles/gal)	2							
Daily emissions - (EF x Engine conversion Factor x Trips x Miles)/Diesel Fuel Efficiency (grams/day)		13418	2870	51892	1887	48	1830	5149368
Daily emissions - (lbs/day) 1 lb = 453.6 grams		30	6	114	4	0	4	11352

Net Change in Emissions: Locomotive - Vehicular (lbs/day)	-1198	-19	42	-4	-1	-4	-146404
SCAQMD Threshold of Significance (lbs/day)	550	55	55	150	150	55	N/A
Significant	NO	NO	NO	NO	NO	NO	N/A

Assumptions:

1. 24 miles from South Perris to Riverside; 60 miles from Riverside to LA
2. Trips per day from proposed train schedule
3. Diesel Fuel Efficiency from Colorado Railcar, LLC 2003 technical data, now U.S. Railcar
4. Engine emission and conversion factors from EPA Technical Memo Emission Factors for Locomotives EPA-420-F-09-025 April 2009
5. SO2 calculations assume the use of ultra low sulfur diesel (ULSD) fuel

PVL Parking Lot Analysis - 2012

Project Conditions:

South Perris Parking Lot Capacity (cars; starts)	880
Length of Lot (feet)	675
Length of Lot (m) (1ft = 0.3048 m)	205.74
Width of Lot (feet)	225
Width of Lot (m)	68.58
Area of lot (square feet)	151875
Area of lot (square meters)	14109.65
Max travel distance: (Length + Width) (feet)	900.00
Max travel distance: (Length + Width) (miles) 1 mile = 5280 feet	0.17

EMFAC2007 CO Starting emission factor @ 12 hrs rest time (g/start) 8.518

Starting Emissions: Starts x CO Starting Emissions Factor (grams) 7495.84

EMFAC2007 CO Idle emission factor (g/hr) 19.29

Idle Emissions: Idle Time x Idle emission factor; 1 min idle veh (grams) 282.92

EMFAC2007 CO emission factor @ 5 mph (g/mi) 4.909

Mobile Emissions @ 5 mph: Max travel distance x EF x vehicles (grams) 736.35

Composite Emissions: Starting + Idle + Mobile (grams) 8515.11

Emission rate for peak hour: Composite Emissions/hour (g/s) 1 hr = 3600 s 2.3653083

Parking lot Area Source Strength: Composite/Area (g/s-sq. meter) 0.000167638

Distance from Parking lot	5m	10m	15m	25m	50m	75m	100m	200m
SCREEN3 Model output Maximum CO concentration (micrograms/cubic meter)	3204	3299	3374	3516	3832	4098	4399	1926
Molecular Weight CO	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01
Temperature (Celsius)	25	25	25	25	25	25	25	25
Atmospheric Pressure (mm of Mercury Hg)	760	760	760	760	760	760	760	760
Maximum 1 hour CO concentration (ppm)	2.80	2.88	2.95	3.07	3.35	3.58	3.84	1.68
1 hour CO background concentration (ppm)	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10
Total 1 hour CO concentration (ppm) (Maximum + background)	6.90	6.98	7.05	7.17	7.45	7.68	7.94	5.78
Maximum 8 hour CO concentration (ppm) Persistence factor = 0.7	4.83	4.89	4.93	5.02	5.21	5.38	5.56	4.05

Assumptions for modeling worst case scenario:

1. Lot filled to capacity - 880 cars
2. All 880 cars leave lot during same peak hour
3. All 880 cars starting after 12 hours in lot
4. All 880 cars idle for 1 minute
5. All 880 cars travel length and width of lot to leave lot.

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Perris Valley Line Project - South Perris Parking Lot

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = .167638E-03
SOURCE HEIGHT (M) = .5000
LENGTH OF LARGER SIDE (M) = 205.7400
LENGTH OF SMALLER SIDE (M) = 68.5800
RECEPTOR HEIGHT (M) = 1.5000
URBAN/RURAL OPTION = URBAN

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BOUY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
5.	3204.	6	1.0	1.0	10000.0	.50	7.
100.	4399.	6	1.0	1.0	10000.0	.50	2.
200.	1926.	6	1.0	1.0	10000.0	.50	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 5. M:

100.	4399.	6	1.0	1.0	10000.0	.50	2.
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*** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	3516.	6	1.0	1.0	10000.0	.50	4.
50.	3832.	6	1.0	1.0	10000.0	.50	1.
15.	3374.	6	1.0	1.0	10000.0	.50	6.
10.	3299.	6	1.0	1.0	10000.0	.50	7.
75.	4098.	6	1.0	1.0	10000.0	.50	0.

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
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SIMPLE TERRAIN appendix E - South Perris Parking Lot.txt
4399. 100. 0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
