Appendix C
Air Quality

ESA

Organization of Appendix C

A number of revisions were made to the air quality calculations presented in the Proponent's Environmental Assessment. This appendix provides the basis for each revision and presents the revised tables that were used in place of tables presented in Appendix F-1 of the PEA.

Localized Significance Thresholds

The LST analysis presented in the PEA normalized emission rates for construction of transmission lines and subtransmission lines assuming that 500 meters (0.31 miles) of activity would impact one receptor. This value was then divided by the total length of the transmission lines (11.7 miles) to get an adjustment factor of 0.02. The maximum daily emissions were then multiplied by 0.02 to 'normalize' for the amount of construction that would occur over one day. Adjusting the maximum daily emissions by a factor of 0.02 does not represent a conservative analysis since the emissions rates are already adjusted to represent a maximum daily emission rate. Since the entire length of the transmission line will not be constructed over one day, adjusting the daily emissions by a factor of 0.02 is not appropriate.

Furthermore, the LST analysis presented in the PEA did not adjust daily emission rates to represent 'on-site' emissions only. This represents an overly-conservative analysis for substation construction activities.

Table C-1 presents the revised LST analysis that is presented in this DEIR. These emission rates are adjusted to represent on-site emissions only. Therefore, fugitive dust emissions from travel on paved and unpaved roads and worker vehicle emissions were not included. However, mass grading emissions from substation improvement activities were included since these emissions will be generated on-site. The bulk of on-site emissions results from operation of heavy duty construction equipment on the project site.

Table C-1 also presents revised LST mass rate thresholds based on the new state ambient air quality standard of 0.18 ppm for NOx. The original LST mass rate threshold was developed based on the ambient air quality standard of 0.25 ppm, and is therefore no longer applicable.

Maximum Daily Emissions

Changes described in this appendix resulted in new maximum daily emission rates from a number of activities. Tables C-2 and C-3 show the revised maximum daily combined emissions and maximum daily emissions from each project component respectively. Also, in Appendix F-1 of the PEA the maximum daily PM2.5 exhaust emissions from on-site vehicles were calculated based on the assumption that 20.8 percent of exhaust PM10 is less than 2.5 microns in diameter. The SCAQMD suggests that approximately 92 percent of all PM10 generated during diesel fuel combustion is less than 2.5 microns in diameter, thus the PM2.5 emission rates from on-site vehicles were adjusted to reflect this fraction (SCAQMD, 2006). Table C-4 presents a revised summary table of fugitive emissions based on changes to paved and unpaved emission rates described in this appendix.

Mass Grading Emission Factor for Substation Grading

Fugitive dust emissions from site grading were estimated in the PEA using the AP-42 emission factor of 80 pounds per are per day. The AP-42 section that provides this emission factor warns that the factor represents total suspended particulate (TSP) matter generated during mass grading (not necessarily particulate matter less than 10 microns in diameter). The SCAQMD suggests that approximately 48.9 percent of TSP generated during grading activities is 10 microns or less in diameter (PM10) and that 20.8 percent of this PM_{10} is less than 2.5 microns in diameter (PM2.5) (SCAQMD, 2006). Therefore, the emission factor was adjusted to 39 pounds of PM10 per acre per day and 8 pounds of PM2.5 per acre per day. Revised emissions from substation grading are presented in Table C-5. This table also includes a summary of revised fugitive emission rates from travel on unpaved roads during substation construction activities.

Unpaved Road Emission Factors

Fugitive dust emission rates from travel on unpaved roads were estimated in the PEA assuming a 60 percent control efficiency from watering roads twice per day. The SCAQMD recommends a control efficiency of 55 percent for watering of unpaved roads (SCAQMD, 2008a). Table C-6 shows revised emission rates from travel on unpaved roads assuming 55 percent control efficiency rather than 60 percent control efficiency.

Paved Road Emission Factors

For control of fugitive emissions from travel on paved roads, the SCAQMD recommends a control efficiency of 16% for local streets and 26% for arterial/collector streets from street sweeping (SCAQMD, 2008b) while the PEA appendix assumes 60% control for heavy duty truck travel per the 1993 SCAQMD CEQA guidance. Table C-7 shows the corrected emission factor for heavy duty truck travel on paved roads while Table C-8 presents the adjusted emission rates from travel on paved roads based on the adjusted emission factor.

References

South Coast Air Quality Management District (SCAQMD), 2006. *Final Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds, Appendix A – Updated CEIDARS Table with $PM_{2.5}$ Fractions*, October 2006.

SCAQMD, 2008a. *Table XI-D: Mitigation Measure Examples: Fugitive Dust Emissions from Unpaved Roads*, Accessed online (http://www.aqmd.gov/CEQA/handbook/mitigation/fugitive/TableXI-D.doc) July 14, 2008.

SCAQMD, 2008b. *Table XI-C: Mitigation Measure Examples: Fugitive Dust Emissions from Paved Roads*, Accessed online (http://www.aqmd.gov/CEQA/handbook/mitigation/fugitive/TableXI-C.doc) July 14, 2008.

Table C-1. Localized Significance Thresholds Analysis

(Replaces Table F-1 of PEA Appendix F1)

Localized Significance Threshold (lb/day)				
Distance to Receptor	**NO_x [a]**	**CO**	**PM_{10}**	**$PM_{2.5}$**
25	117	845	4	3
50	120	1,328	13	6
100	210	2,422	35	10
250	332	5,687	80	24
500	647	23,061	214	105

[a] Thresholds for NOx have been adjusted based on revised 1 hour state ambient air quality standard of 0.18 ppm.

Construction Emissions (lb/day) [1]					
	Distance to Receptor	**Maximum Daily Onsite Emissions [2]**			
Phase	**(m)**	**CO**	**NOx**	**PM10**	**PM2.5**
Transmission Line	25	69.1	**143.3**	**14.8**	**6.9**
Subtransmission Line	25	78.5	**230.9**	**17.6**	**9.4**
Devers Substation Construction	250	21.5	44.8	2.6	2.2
Mirage Substation Construction	50	52.0	119.6	**21.6**	**8.8**
Concho Substation Construction	20	2.1	4.1	0.2	0.2
Indian Wells Substation Construction	35	2.1	4.1	0.2	0.2
Santa Rosa Construction	40	2.1	4.1	0.2	0.2
Eisenhower Substation Construction	50	23.7	51.3	3.0	2.5
Farrell Substation Construction	24	23.7	51.3	3.5	2.6
Garnet Substation Construction	25	2.1	4.1	0.2	0.2
Thornhill Substation Construction	10	2.1	4.1	0.2	0.2
Tamarisk Substation Construction	10	17.9	34.1	2.7	0.2
Telecommunications	30	20.4	62.3	3.0	2.7

[1] Values above the LSTs are shown in **BOLD.**

[2] Values include onsite emissions only (worker trips and fugitive dust from paved and unpaved roads were not included).

Table C-2. Maximum Daily Combined Emissions Summary

(Replaces Table F-2 of PEA Appendix F1)

Quarter	Construction Phases Occurring Simultaneously	Combined Maximum Daily Emissions (lbs/day)					
		CO	NOx	ROG	SOx	PM10	PM2.5
2nd Quarter, 2010	Subtransmission Line (Mirage-Santa Rosa)	103.3	233.5	22.6	0.3	246.2	57.4
3rd Quarter, 2010	Mirage Substation Construction, Devers Substation Construction, Eisenhower Substation Construction	115.6	217.6	26.6	0.2	52.4	18.9
3rd Quarter, 2010	Mirage Substation Construction, Devers Substation Construction, Eisenhower Substation Construction, Subtransmission Line (Mirage-Santa Rosa-Tamarisk)	218.9	451.1	49.2	0.5	298.6	76.2
3rd Quarter, 2010	Mirage Substation Construction, Concho Substation Construction, Eisenhower Substation Construction, Subtransmission Line (Mirage-Santa Rosa-Tamarisk)	197.4	410.2	44.1	0.5	283.6	71.6
4th Quarter, 2010	Mirage Substation Construction, Concho Substation Construction, Farrell Substation Construction, Subtransmission Line (Mirage-Santa Rosa-Tamarisk)	197.4	410.2	44.1	0.5	284.0	71.7
1st Quarter, 2011	Mirage Substation Construction, Indian Wells Substation Construction, Farrell Substation Construction, Subtransmission Line (Mirage-Devers-Capwind-Tamarisk)	197.4	410.2	44.1	0.5	284.0	71.7
1st Quarter, 2011	Mirage Substation Construction, Indian Wells Substation Construction, Thornhill Substation Construction, Subtransmission Line (Mirage-Devers-Capwind-Tamarisk)	173.8	362.8	38.3	0.4	272.4	67.5
1st Quarter, 2011	Mirage Substation Construction, Indian Wells Substation Construction, Thornhill Substation Construction, Subtransmission Line (Mirage-Devers-Capwind-Tamarisk)	173.8	362.8	38.3	0.4	272.4	67.5
1st Quarter, 2011	Mirage Substation Construction, Santa Rosa Substation Construction, Thornhill Substation Construction, Subtransmission Line (Mirage-Devers-Capwind-Tamarisk)	173.8	362.8	38.3	0.4	272.4	67.5
1st Quarter, 2011	Mirage Substation Construction, Santa Rosa Substation Construction, Thornhill Substation Construction, Subtransmission Line (Mirage-Concho)	173.8	362.8	38.3	0.4	272.4	67.5
2nd Quarter, 2011	Mirage Substation Construction, Santa Rosa Substation Construction, Tamarisk Substation Construction, Subtransmission Line (Mirage-Concho)	190.6	392.9	42.2	0.4	269.9	68.1
2nd Quarter, 2011	Mirage Substation Construction, Garnet Substation Construction, Tamarisk Substation Construction, Subtransmission Line (Mirage-Concho)	190.6	392.9	42.2	0.4	274.1	69.0
2nd Quarter, 2011	Mirage Substation Construction, Garnet Substation Construction, Tamarisk Substation Construction, Transmission Line (Devers-Mirage #2)	162.8	303.4	33.7	1.7	172.9	45.6
2nd Quarter, 2011	Transmission Line (Devers-Mirage #2, Coachella Valley-Mirage)	75.5	144.0	14.0	1.5	144.9	34.0

Table C-3. Maximum Daily Emissions Per Construction Phase

(Replaces Table F-3 of PEA Appendix F1)

Phase	Emissions (lbs/day)					
	CO	NOx	ROG	SOx	PM10	PM2.5
Transmission Line Loop-In						
Fugitive Dust	0.00	0.00	0.00	0.00	137.85	27.53
On-site vehicle Exhaust	69.14	143.32	13.40	1.54	7.04	6.48
Employee Vehicles	6.33	0.66	0.65	0.01	0.05	0.03
Total	*75.47*	*143.99*	*14.04*	*1.55*	*144.94*	*34.03*
Subtransmission Line						
Fugitive Dust	0.00	0.00	0.00	0.00	236.14	48.20
On-site vehicle Exhaust	78.53	230.94	20.06	0.24	9.84	9.05
Employee Vehicles	24.79	2.59	2.54	0.03	0.20	0.12
Total	*103.32*	*233.53*	*22.59*	*0.27*	*246.18*	*57.37*
Devers Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	12.85	2.73
On-site vehicle Exhaust	21.48	44.77	5.21	0.05	2.26	2.08
Employee Vehicles	3.16	0.33	0.32	0.00	0.03	0.02
Total	*24.64*	*45.10*	*5.54*	*0.05*	*15.14*	*4.83*
Mirage Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	15.52	3.23
On-site vehicle Exhaust	51.96	119.57	13.43	0.12	6.05	5.57
Employee Vehicles	12.13	1.27	1.24	0.01	0.10	0.06
Total	*64.10*	*120.84*	*14.67*	*0.13*	*21.67*	*8.85*
Concho Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
On-site vehicle Exhaust	2.13	4.10	0.39	0.00	0.18	0.17
Employee Vehicles	1.05	0.11	0.11	0.00	0.01	0.01
Total	*3.19*	*4.21*	*0.50*	*0.01*	*0.19*	*0.18*
Indian Wells Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
On-site vehicle Exhaust	2.13	4.10	0.39	0.00	0.18	0.17
Employee Vehicles	1.05	0.11	0.11	0.00	0.01	0.01
Total	*3.19*	*4.21*	*0.50*	*0.01*	*0.19*	*0.18*
Santa Rosa Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
On-site vehicle Exhaust	2.13	4.10	0.39	0.00	0.18	0.17
Employee Vehicles	1.05	0.11	0.11	0.00	0.01	0.01
Total	*3.19*	*4.21*	*0.50*	*0.01*	*0.19*	*0.18*
Eisenhower Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	12.90	2.74
On-site vehicle Exhaust	23.66	51.30	6.05	0.05	2.64	2.43
Employee Vehicles	3.16	0.33	0.32	0.00	0.03	0.02
Total	*26.82*	*51.63*	*6.38*	*0.06*	*15.57*	*5.19*
Farrell Substation Construction						
Fugitive Dust	0.00	0.00	0.00	0.00	13.32	2.82
On-site vehicle Exhaust	23.66	51.30	6.05	0.05	2.64	2.43
Employee Vehicles	3.16	0.33	0.32	0.00	0.03	0.02
Total	*26.82*	*51.63*	*6.38*	*0.06*	*15.99*	*5.27*

Phase		Emissions (lbs/day)					
		CO	NOx	ROG	SOx	PM10	PM2.5
Garnet Substation Construction							
	Fugitive Dust	0.00	0.00	0.00	0.00	4.19	0.90
	On-site vehicle Exhaust	2.13	4.10	0.39	0.00	0.18	0.17
	Employee Vehicles	1.05	0.11	0.11	0.00	0.01	0.01
	Total	*3.19*	*4.21*	*0.50*	*0.01*	*4.38*	*1.08*
Thornhill Substation Construction							
	Fugitive Dust	0.00	0.00	0.00	0.00	4.19	0.90
	On-site vehicle Exhaust	2.13	4.10	0.39	0.00	0.18	0.17
	Employee Vehicles	1.05	0.11	0.11	0.00	0.01	0.01
	Total	*3.19*	*4.21*	*0.50*	*0.01*	*4.38*	*1.08*
Tamarisk Substation Construction							
	Fugitive Dust	0.00	0.00	0.00	0.00	0.06	0.01
	On-site vehicle Exhaust	17.88	34.10	4.24	0.04	1.79	1.65
	Employee Vehicles	2.11	0.22	0.22	0.00	0.02	0.01
	Total	*19.99*	*34.32*	*4.46*	*0.04*	*1.87*	*1.67*
Telecommunications Line							
	Fugitive Dust	0.00	0.00	0.00	0.00	51.61	10.80
	On-site vehicle Exhaust	20.37	62.28	5.65	0.06	2.98	2.74
	Employee Vehicles	2.11	0.22	0.22	0.00	0.02	0.01
	Total	*22.48*	*62.50*	*5.86*	*0.06*	*54.61*	*13.55*

Table C-4. Fugitive Dust Summary for Transmission Line, Subtranmission Line, and Telecommunications Construction

(Replaces Table F-4 of PEA Appendix F-1)

Construction Element	Maximum Fugitive Dust Emissions (lb/day)	
	PM10	PM2.5
Road Construction		
Grading	20.23	10.46
Transmission Line Loop-In		
Unpaved Road Dust	119.66	25.38
Paved Road Dust	10.39	1.76
Dig Foundation Dust	7.80	0.39
Total	137.85	27.53
Subtransmission Line		
Unpaved Road Dust	216.50	45.81
Paved Road Dust	11.84	2.00
Dig Foundation Dust	7.80	0.39
Total	236.14	48.20
Telecommunications		
Unpaved Road Dust	48.69	10.31
Paved Road Dust	2.92	0.49
Total	51.61	10.80

Table C-5. Substation Construction - Fugitive Dust Emission

(Replaces Table F-5 of PEA Appendix F-1)

Using Graders

E =	80 lbs of Total Suspended Particulate Matter/acre-day [a]
PM10 Fraction =	0.489 [b]
Control Efficiency =	60%

[a] Emission Factor from AP-42 Section 13.2.3

[b] Source: SCAQMD, *Final Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds, Appendix A - Updated CEIDARS Table with PM2.5 Fractions* , October 2006.

Substation	Total Acres Disturbed	Maximum Controlled Fugitive Dust Emissions		Unpaved Road Travel Fugitive Dust[4]		Total Controlled Fugitive Dust	
		PM10 (lb/day)[1,2]	PM2.5 (lb/day)[3]	PM10 (lb/day)	PM2.5 (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Devers	0.022	0.34	0.07	12.51	2.66	12.85	2.73
Mirage	0.992	15.52	3.23	0.00	0.00	15.52	3.23
Concho	0.000	0.00	0.00	0.00	0.00	0.00	0.00
Indian Wells	0.000	0.00	0.00	0.00	0.00	0.00	0.00
Santa Rosa	0.000	0.00	0.00	0.00	0.00	0.00	0.00
Eisenhower	0.025	0.39	0.08	12.51	2.66	12.90	2.74
Farrell	0.052	0.81	0.17	12.51	2.66	13.32	2.82
Garnet	0.000	0.00	0.00	4.19	0.90	4.19	0.90
Thornhill	0.000	0.00	0.00	4.19	0.90	4.19	0.90
Tamarisk	0.004	0.06	0.01	0.00	0.00	0.06	0.01

[1] The maximum fugitive emissions are assumed to occur during site grading activities.

[2] Site grading activities for each site were assumed to be completed in one day.

[3] PM2.5 fraction of PM10 was assumed to be 0.208 per SCAQMD's *Final Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds, Appendix A - Updated CEIDARS Table with PM2.5 Fractions.*

[4] Based on adjusted numbers from PEA Appendix F-1: Air Quality Calculations, Table F-9, Unpaved Road Travel During Construction - Fugitive Dust Emissions.

Table C-6. Fugitive Dust from Travel on Unpaved Roads

(adjusts controlled emission rates from Table F-9 of PEA Appendix F-1)

	Uncontrolled Emissions[1]				Controlled Emissions (55%)			
	PM10		PM2.5		PM10		PM2.5	
Activity	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)
Subtransmission Line								
Survey								
Worker Traffic	13.90	41.70	2.90	8.80	6.26	18.77	1.31	3.96
1/2-Ton Pick-up	11.60	34.90	2.50	7.40	5.22	15.71	1.13	3.33
					11.48	34.47	2.43	7.29
Roads								
Worker Traffic	18.50	185.40	3.90	39.30	8.33	83.43	1.76	17.69
1-Ton Crew Cab (4X4)	23.30	232.80	4.90	49.40	10.49	104.76	2.21	22.23
Road Grader	27.40	274.20	5.80	58.10	12.33	123.39	2.61	26.15
Track Type Dozer	54.80	548.50	11.60	116.30	24.66	246.83	5.22	52.34
Water Truck	27.40	274.20	5.80	58.10	12.33	123.39	2.61	26.15
					68.13	681.80	14.40	144.54
Pole Framing and Setting								
Worker Traffic	74.20	10904.30	15.70	2311.70	33.39	4906.94	7.07	1040.27
¾-Ton Suburban	23.30	3421.90	4.90	725.50	10.49	1539.86	2.21	326.48
5-Ton Framing Truck 4X4	54.80	4552.40	11.60	965.10	24.66	2048.58	5.22	434.30
30-Ton Line Truck	54.80	4552.40	11.60	965.10	24.66	2048.58	5.22	434.30
Digger Truck	27.40	658.20	5.80	139.50	12.33	296.19	2.61	62.78
Water Truck	27.40	2276.20	5.80	482.60	12.33	1024.29	2.61	217.17
Backhoe	54.80	8062.70	11.60	1709.30	24.66	3628.22	5.22	769.19
Bucket Truck	54.80	8062.70	11.60	1709.30	24.66	3628.22	5.22	769.19
Truck-Mounted Crane	54.80	8062.70	11.60	1709.30	24.66	3628.22	5.22	769.19
30-Ton Crane	27.40	383.90	5.80	81.40	12.33	172.76	2.61	36.63
Cement Truck	27.40	82.30	5.80	17.40	12.33	37.04	2.61	7.83
					216.50	22958.87	45.81	4867.29
Material Delivery								
Worker Traffic	13.90	69.50	2.90	14.70	6.26	31.28	1.31	6.62
60-Foot Flat-Bed Pole Truck	54.80	274.20	11.60	58.10	24.66	123.39	5.22	26.15
Forklift	27.40	137.10	5.80	29.10	12.33	61.70	2.61	13.10
					43.25	216.36	9.14	45.86

Activity	Uncontrolled Emissions[1]				Controlled Emissions (55%)			
	PM10		PM2.5		PM10		PM2.5	
	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)
Conductor Installation								
Worker Traffic	74.20	1780.30	15.70	377.40	33.39	801.14	7.07	169.83
Flat-Bed Truck & Trailer (Wire Puller)	27.40	658.20	5.80	139.50	12.33	296.19	2.61	62.78
Flat-Bed Truck & Trailer (Wire Dolly)	27.40	658.20	5.80	139.50	12.33	296.19	2.61	62.78
30-Ton Line Truck	54.80	1316.40	11.60	279.10	24.66	592.38	5.22	125.60
¾-Ton Suburban	23.30	325.90	4.90	69.10	10.49	146.66	2.21	31.10
Water Truck	27.40	658.20	5.80	139.50	12.33	296.19	2.61	62.78
Bucket Truck	54.80	1316.40	11.60	279.10	24.66	592.38	5.22	125.60
Truck-Mounted Crane	54.80	1316.40	11.60	279.10	24.66	592.38	5.22	125.60
					154.85	3613.50	32.76	766.04
Restoration								
Worker Traffic	37.10	1483.60	7.90	314.50	16.70	667.62	3.56	141.53
1-Ton Crew Cab 4X4	23.30	931.10	4.90	197.40	10.49	419.00	2.21	88.83
Water Truck	27.40	1097.00	5.80	232.60	12.33	493.65	2.61	104.67
					39.51	1580.27	8.37	335.03
Max Subtransmission Line					***216.50***	***22958.87***	***45.81***	***4867.29***
Telecommunications								
Worker Traffic	18.50	2077.00	3.90	440.30	8.33	934.65	1.76	198.14
Crew Truck (gasoline)	23.30	2653.70	4.90	562.60	10.49	1194.17	2.21	253.17
Crew Truck (gasoline)	11.60	989.30	2.50	209.70	5.22	445.19	1.13	94.37
Bucket Truck	54.80	1371.20	11.60	290.70	24.66	617.04	5.22	130.82
Max Telecommunications					***48.69***	***3191.04***	***10.31***	***676.49***
Transmission Line Loop-In								
Survey								
½-Ton Pick-Up	23.30	69.80	4.90	14.80	10.49	31.41	2.21	6.66
					10.49	31.41	2.21	6.66
Marshalling Yards								
1-Ton Crew Cab	11.60	989.30	2.50	209.70	5.22	445.19	1.13	94.37
Truck, Semi-Tractor	27.40	2331.10	5.80	494.20	12.33	1049.00	2.61	222.39
					17.55	1494.18	3.74	316.76
Roads and Landing Work								
1-Ton Crew Cab	11.60	34.90	2.50	7.40	5.22	15.71	1.13	3.33
Water Truck	82.30	246.80	17.40	52.30	37.04	111.06	7.83	23.54
Lowboy Truck & Trailer	27.40	82.30	5.80	17.40	12.33	37.04	2.61	7.83
					54.59	163.80	11.57	34.70

Activity	Uncontrolled Emissions[1]				Controlled Emissions (55%)			
	PM10		PM2.5		PM10		PM2.5	
	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)
Install Foundations								
1-Ton Crew Cab	46.60	791.50	9.90	167.80	20.97	356.18	4.46	75.51
4,000 Gallon Water Truck	54.80	932.40	11.60	197.70	24.66	419.58	5.22	88.97
Concrete Mixer Truck	164.50	2797.30	34.90	593.00	74.03	1258.79	15.71	266.85
					119.66	2034.54	25.38	431.33
Tower Legs, Haul and Erection								
1-Ton Crew Cab	11.60	46.60	2.50	9.90	5.22	20.97	1.13	4.46
30-Ton Crane Truck	27.40	109.70	5.80	23.30	12.33	49.37	2.61	10.49
Truck & Trailer	27.40	109.70	5.80	23.30	12.33	49.37	2.61	10.49
Truck & Trailer	54.80	274.20	11.60	58.10	24.66	123.39	5.22	26.15
					54.54	243.09	11.57	51.57
Tower Assembly								
Crane Truck	54.80	438.80	11.60	93.00	24.66	197.46	5.22	41.85
Pick-Up Truck	34.90	279.30	7.40	59.20	15.71	125.69	3.33	26.64
Crew Cab Flat-Bed	46.60	372.50	9.90	79.00	20.97	167.63	4.46	35.55
Compressor Truck	23.30	186.20	4.90	39.50	10.49	83.79	2.21	17.78
					71.82	574.56	15.21	121.82
Tower and TSP Erection								
Pick-Up Truck	11.60	93.10	2.50	19.70	5.22	41.90	1.13	8.87
Crew Cab Flat-Bed	23.30	186.20	4.90	39.50	10.49	83.79	2.21	17.78
Compressor Truck	11.60	93.10	2.50	19.70	5.22	41.90	1.13	8.87
					20.93	167.58	4.46	35.51
Tower Removal								
Pick-Up Truck	11.60	46.60	2.50	9.90	5.22	20.97	1.13	4.46
Flat-Bed Truck	11.60	46.60	2.50	9.90	5.22	20.97	1.13	4.46
					10.44	41.94	2.25	8.91
Conductor Installation								
Crew Cab Flat-Bed	34.90	349.20	7.40	74.00	15.71	157.14	3.33	33.30
Wire Truck & Trailer	54.80	329.10	11.60	69.80	24.66	148.10	5.22	31.41
Dump Truck (Trash)	27.40	274.20	5.80	58.10	12.33	123.39	2.61	26.15
Pick-Up Truck	11.60	116.40	2.50	24.70	5.22	52.38	1.13	11.12
Log Truck & Trailer	27.40	274.20	5.80	58.10	12.33	123.39	2.61	26.15
Static Truck	27.40	164.50	5.80	34.90	12.33	74.03	2.61	15.71
Lowboy Truck & Trailer	27.40	274.20	5.80	58.10	12.33	123.39	2.61	26.15
					94.91	801.81	20.12	169.97

Activity	Uncontrolled Emissions[1]				Controlled Emissions (55%)			
	PM10		PM2.5		PM10		PM2.5	
	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)	(lbs/day)	(lbs/activity)
Restoration								
Crew Cab	11.60	46.60	2.50	9.90	5.22	20.97	1.13	4.46
Water Truck	82.30	329.10	17.40	69.80	37.04	148.10	7.83	31.41
Lowboy Truck & Trailer	27.40	109.70	5.80	23.30	12.33	49.37	2.61	10.49
					54.59	218.43	11.57	46.35
Max Transmission Line Loop-In					***119.66***	***2034.54***	***25.38***	***431.33***
Substations								
Devers Substation								
Worker Traffic	27.80	2030.60	5.90	430.50	12.51	913.77	2.66	193.73
Eisenhower Substation								
Worker Traffic	27.80	2030.60	5.90	430.50	12.51	913.77	2.66	193.73
Farrell Substation								
Worker Traffic	27.80	2698.30	5.90	572.00	12.51	1214.24	2.66	257.40
Garnet Substation								
Worker Traffic	9.30	296.70	2.00	62.90	4.19	133.52	0.90	28.31
Thornhill Substation								
Worker Traffic	9.30	741.80	2.00	157.30	4.19	333.81	0.90	70.79
Max Substation					***12.51***	***913.77***	***2.66***	***193.73***

[1] Rates are from PEA Appendix F-1, Table F-9 Unpaved Road Travel During Construction.

Table C-7. Heavy Duty Vehicle Fugitive Dust Emission Factor For Travel on Paved Roads

(Replaces Emission Factor for Fugitive Dust emissions from Heavy Duty Vehicle Travel on Paved Roads)

Heavy Vehicles on Paved Road Fugitive Dust

Use SCAQMD CEQA Table A9-9-C
E = VxF (PM10 without street cleaning)
V = vehicles mile traveled
F = 0.77* ((G*0.35)^0.3) lbs/VMT

Assume following reductions per SCAQMD Table XI-C, Mitigation Measure Examples - Fugitive Dust From Paved Roads:
16% control of fugitive dust for street sweeping on local streets
26% control of fugitive dust for street sweeping on arterial/collector streets

	G	F	Control Efficiency	F (controlled)
Local Streets	0.04	0.2140	0.16	0.1797
Collector	0.03	0.1963	0.26	0.1452
Major Streets/Highways	0.012	0.1491	0.26	0.1103
Freeways	0.00065	0.0622	NA	0.0622

Assumed Mix of Roads

0.1	Local streets
0.1	Collector Streets
0.1	Major Streets/Highways
0.7	Freeways

Composite Heavy Vehicle Factor

0.0870	**PM10 per VMT**
0.169	PM2.5 fraction of PM10 from SCAQMD Table A - Updated CEIDARS Table with PM2.5 Fractions
0.01471	**PM2.5 per VMT**

Table C-8. Fugitive Dust from Travel on Paved Roads

(adjusts controlled emission rates from Table F-10 of PEA Appendix F-1)

Activity	Number	Days	Hours/Day	VMT/day	F PM10 (lbs/VMT)	F PM2.5 (lbs/VMT)	PM10 (lbs/day)	PM10 lbs activity	PM2.5 (lbs/day)	PM2.5 lbs activity
Subtransmission Line										
Survey										
½-Ton Pick-Up	1	3	10	9.54	0.0116	0.00196	0.1	0.3	0.0	0.1
							0.1	0.3	0.0	0.1
Roads										
1-Ton Crew Cab 4X4	2	10	2	9.54	0.0116	0.00196	0.2	2.2	0.0	0.4
Road Grader	1	10	10	9.54	0.087	0.01471	0.8	8.3	0.1	1.4
Track-Type Dozer	2	10	2.5	9.54	0.087	0.01471	1.7	16.6	0.3	2.8
Water Truck	1	10	10	9.54	0.087	0.01471	0.8	8.3	0.1	1.4
							3.5	35.4	0.6	6.0
Pole Framing and Setting										
¾-Ton Suburban	2	147	10	9.54	0.0116	0.00196	0.2	32.5	0.0	5.5
5-Ton Framing Truck 4X4	2	83	10	9.54	0.087	0.01471	1.7	137.8	0.3	23.3
30-Ton Line Truck	2	83	10	9.54	0.087	0.01471	1.7	137.8	0.3	23.3
Digger Truck	1	24	10	9.54	0.087	0.01471	0.8	19.9	0.1	3.4
Water Truck	1	83	10	9.54	0.087	0.01471	0.8	68.9	0.1	11.6
Backhoe	2	147	10	9.54	0.087	0.01471	1.7	244.0	0.3	41.3
Bucket Truck	2	147	10	9.54	0.087	0.01471	1.7	244.0	0.3	41.3
Truck-Mounted Crane	2	147	10	9.54	0.087	0.01471	1.7	244.0	0.3	41.3
30-Ton Crane	1	14	10	9.54	0.087	0.01471	0.8	11.6	0.1	2.0
Cement Truck	1	3	10	9.54	0.087	0.01471	0.8	2.5	0.1	0.4
							11.8	1143.0	2.0	193.3
Material Delivery										
60-Foot Flat-Bed Pole Truck	2	5	8	9.54	0.087	0.01471	1.7	8.3	0.3	1.4
Forklift	1	5	8	9.54	0.087	0.01471	0.8	4.1	0.1	0.7
							2.5	12.4	0.4	2.1
Conductor Installation										
Flat-Bed Truck & Trailer (Wire Puller)	1	24	6	9.54	0.087	0.01471	0.8	19.9	0.1	3.4
Flat-Bed Truck & Trailer (Wire Dolly)	1	24	6	9.54	0.087	0.01471	0.8	19.9	0.1	3.4
30-Ton Line Truck	2	24	5	9.54	0.087	0.01471	1.7	39.8	0.3	6.7
¾-Ton Suburban	2	14	10	9.54	0.0116	0.00196	0.2	3.1	0.0	0.5
Water Truck	1	24	10	9.54	0.087	0.01471	0.8	19.9	0.1	3.4
Bucket Truck	2	24	6	9.54	0.087	0.01471	1.7	39.8	0.3	6.7
Truck-Mounted Crane	2	24	6	9.54	0.087	0.01471	1.7	39.8	0.3	6.7
							7.7	182.4	1.3	30.8

Activity	Number	Days	Hours/Day	VMT/day	F PM10 (lbs/VMT)	F PM2.5 (lbs/VMT)	PM10 (lbs/day)	PM10 lbs activity	PM2.5 (lbs/day)	PM2.5 lbs activity
Restoration										
1-Ton Crew Cab 4X4	2	40	8	9.54	0.0116	0.00196	0.2	8.9	0.0	1.5
Water Truck	1	40	8	9.54	0.087	0.01471	0.8	33.2	0.1	5.6
							1.1	42.1	0.2	7.1
Max Subtransmission Line							***11.84***	***1143.05***	***2.00***	***193.26***
Telecommunications										
Crew Truck (gasoline)	2	114	8	14	0.0116	0.00196	0.3	37.0	0.1	6.3
Crew Truck (gasoline)	1	85	8	14	0.0116	0.00196	0.2	13.8	0.0	2.3
Bucket Truck	2	25	8	14	0.087	0.01471	2.4	60.9	0.4	10.3
							2.9	***111.7***	***0.5***	***18.9***
Transmission Line Loop-In										
Survey										
½-Ton Pick-Up	2	3	8	14	0.0116	0.01471	0.3	1.0	0.4	1.2
							0.3	1.0	0.4	1.2
Marshalling Yards										
1-Ton Crew Cab	1	85	2	14	0.0116	0.00196	0.2	13.8	0.0	2.3
Truck, Semi-Tractor	1	85	1	14	0.087	0.01471	1.2	103.5	0.2	17.5
							1.4	117.3	0.2	19.8
Roads and Landing Work										
1-Ton Crew Cab	1	3	5	14	0.0116	0.00196	0.2	0.5	0.0	0.1
Water Truck	3	3	10	14	0.087	0.01471	3.7	11.0	0.6	1.9
Lowboy Truck & Trailer	1	3	4	14	0.087	0.01471	1.2	3.7	0.2	0.6
							5.0	15.1	0.9	2.6
Install Foundations										
1-Ton Crew Cab	4	17	6	14	0.0116	0.00196	0.6	11.0	0.1	1.9
4,000 Gallon Water Truck	2	17	5	14	0.087	0.01471	2.4	41.4	0.4	7.0
Concrete Mixer Truck	6	17	5	14	0.087	0.01471	7.3	124.2	1.2	21.0
							10.4	176.7	1.8	29.9
Tower Legs, Haul and Erection										
1-Ton Crew Cab	1	4	6	14	0.0116	0.00196	0.2	0.6	0.0	0.1
30-Ton Crane Truck	1	4	8	14	0.087	0.01471	1.2	4.9	0.2	0.8
Truck & Trailer	1	4	5	14	0.087	0.01471	1.2	4.9	0.2	0.8
Truck & Trailer	2	5	10	14	0.087	0.01471	2.4	12.2	0.4	2.1
							5.0	22.6	0.9	3.8

Activity	Number	Days	Hours/Day	VMT/day	F PM10 (lbs/VMT)	F PM2.5 (lbs/VMT)	PM10 (lbs/day)	PM10 lbs activity	PM2.5 (lbs/day)	PM2.5 lbs activity
Tower Assembly										
Crane Truck	2	8	8	14	0.087	0.01471	2.4	19.5	0.4	3.3
Pick-Up Truck	3	8	10	14	0.0116	0.00196	0.5	3.9	0.1	0.7
Crew Cab Flat-Bed	4	8	5	14	0.0116	0.00196	0.6	5.2	0.1	0.9
Compressor Truck	2	8	5	14	0.0116	0.00196	0.3	2.6	0.1	0.4
							3.9	31.2	0.7	5.3
Tower and TSP Erection										
Pick-Up Truck	1	8	5	14	0.0116	0.00196	0.2	1.3	0.0	0.2
Crew Cab Flat-Bed	2	8	5	14	0.0116	0.00196	0.3	2.6	0.1	0.4
Compressor Truck	1	8	5	14	0.0116	0.00196	0.2	1.3	0.0	0.2
							0.6	5.2	0.1	0.9
Tower Removal										
Pick-Up Truck	1	4	8	14	0.0116	0.00196	0.2	0.6	0.0	0.1
Flat-Bed Truck	1	4	8	14	0.0116	0.00196	0.2	0.6	0.0	0.1
							0.3	1.3	0.1	0.2
Conductor Installation										
Crew Cab Flat-Bed	3	10	8	14	0.0116	0.00196	0.5	4.9	0.1	0.8
Wire Truck & Trailer	2	6	2	14	0.087	0.01471	2.4	14.6	0.4	2.5
Dump Truck (Trash)	1	10	2	14	0.087	0.01471	1.2	12.2	0.2	2.1
Pick-Up Truck	1	10	10	14	0.0116	0.00196	0.2	1.6	0.0	0.3
Log Truck & Trailer	1	10	2	14	0.087	0.01471	1.2	12.2	0.2	2.1
Static Truck	1	6	2	14	0.087	0.01471	1.2	7.3	0.2	1.2
Lowboy Truck & Trailer	1	10	2	14	0.087	0.01471	1.2	12.2	0.2	2.1
							8.0	65.0	1.3	11.0
Restoration										
Crew Cab	1	4	5	14	0.0116	0.00196	0.2	0.6	0.0	0.1
Water Truck	3	4	10	14	0.087	0.01471	3.7	14.6	0.6	2.5
Lowboy Truck & Trailer	1	4	4	14	0.087	0.01471	1.2	4.9	0.2	0.8
							5.0	20.1	0.9	3.4
Max Transmission Line Loop-In							***10.39***	***176.69***	***1.76***	***29.87***

Table F-6. Employee Vehicle - Exhaust Emissions

Employee Vehicle Emissions

Emission Factors
from SCAQMD Highest (Most Conservative) EMFAC 2007 Emission Factors for On-Road Passenger Vehicles and Delivery Trucks

E = F* VMT
F = Emission factor per passenger vehicle (lb/VMT)
VMT = Vehicle Miles Traveled
VMT per employee = 50 miles (Assumed)
E = Emissions lb/day

Emission Factors for 2008 (lb/VMT)

CO =	0.01055
NOx =	0.00110
ROG =	0.00108
SOx =	0.00001
PM10 =	0.00009
PM2.5 =	0.00005

Emission Summary

Construction Phase	Employees per day*	CO (lbs/day)	NOx (lbs/day)	ROG (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Transmission Line Loop-In	12	6.33	0.66	0.65	0.01	0.05	0.03
Subtransmission Lines	47	24.79	2.59	2.54	0.03	0.20	0.12
Devers Substation	6	3.16	0.33	0.32	0.00	0.03	0.02
Mirage Substation	23	12.13	1.27	1.24	0.01	0.10	0.06
Concho Substation	2	1.05	0.11	0.11	0.00	0.01	0.01
Indian Wells Substation	2	1.05	0.11	0.11	0.00	0.01	0.01
Santa Rosa Substation	2	1.05	0.11	0.11	0.00	0.01	0.01
Eisenhower Substation	6	3.16	0.33	0.32	0.00	0.03	0.02
Farrell Substation	6	3.16	0.33	0.32	0.00	0.03	0.02
Garnet Substation	2	1.05	0.11	0.11	0.00	0.01	0.01
Thornhill Substation	2	1.05	0.11	0.11	0.00	0.01	0.01
Tamarisk Substation	4	2.11	0.22	0.22	0.00	0.02	0.01
Telecommunication	4	2.11	0.22	0.22	0.00	0.02	0.01

* This is the maximum number of employees per day expected for this phase of the project

Table F-7. Road Grading - Fugitive Dust Emissions

On-site fugitive dust sources during grading of road

Using Graders

Emission Factors
from AP42 Table 11.9-1

E=k*0.051*(S^2) for PM10

E=k*0.040*(S^2.5) for PM2.5
k=.6 PM10
k=.031 PM2.5
S=mean speed
E=lbs/VMT

E(PM10)	0.2754	lbs/VMT
E(PM2.5)	0.0193	lbs/VMT
Assume	3	mph grader speed
E(PM10)	0.826	lbs/hr
E(PM2.5)	0.058	lbs/hr
Assume	5	hours per day grading
E(PM10)	4.13	lbs/day/grader
E(PM2.5)	0.29	lbs/day/grader
Assume	1	Grader
E(PM10)	4.1	lbs/day
E(PM2.5)	0.3	lbs/day
Assume	10	days of grading
E(PM10)	41	lbs total activity
E(PM2.5)	3	lbs total activity

Crawler Operation

Used dozer equation in
AP 42 Tables 11.9-1 and 11.9-2

E(PM10)= k*(s^1.5)/(M^1.4)
E(PM2.5)= k*5.7*(^1.2)/(M^1.3)

k= .75 for PM10
k=0.105 for PM2.5
s=silt content %
M= moisture content %

Assume

s=	8.5	%
M=	8	%
E(PM10)=	1.011	lb/hr
E(PM2.5)=	0.523	lb/hr

Assume

	10	hrs/day
	2	dozers
E(PM10)	20.2	lbs/day
E(PM2.5)	10.5	lbs/day

Assume

	10	days compacting
E(PM10)	202	lbs total activity
E(PM2.5)	105	lbs total activity

Uncontrolled Fugitive Dust Emission Summary

PM10 (lbs/day)	PM10 Total Activity (lbs)	PM2.5 (lbs/day)	PM2.5 Total Activity (lbs)	Activity
4	41	0	3	Using Graders
20	202	10	105	Using Crawlers
24	244	11	107	Total Uncontrolled

Assume 60% control factor for using watering trucks

PM10 (lbs/day)	PM10 Total Activity (lbs)	PM2.5 (lbs/day)	PM2.5 Total Activity (lbs)	Activity
10	97	4	43	**Total Controlled**

Table F-8. Dig Foundation - Fugitive Dust Emissions

On-site fugitive dust sources during digging foundations

Digger Truck Operation
Used AP42 11.9-4

E(TSP)= 1.3 lb/hole

Assume

10	holes per day	
0.6	factor for PM10 (like grader)	
0.03	factor for PM2.5 (like grader)	
E(PM10)	7.8	lbs/day
E(PM2.5)	0.4	lbs/day

Assume

24	days drilling	
E(PM10)	187	lbs total activity
E(PM2.5)	9	lbs total activity

Table F-11. Subtransmission Line Construction - Route Details

Route	Distance (Miles)	
	Paved	Unpaved
Farrell-Garnet (Alternative Route 1) Starting from Devers Substation	6.00	2.33
Farrell-Garnet (Alternative Route 2) Starting from Devers Substation	4.60	4.77
Farrell-Garnet (Alternative Route 3) Starting from Devers Substation	7.00	2.33
Devers Coachella Valley Loop-In Starting from Mirage Substation	0.00	0.95
Mirage-Santa Rosa (Alternative Route 1) Starting from Mirage Substation	0.00	1.42
Mirage-Santa Rosa (Alternative Route 2) Starting from Mirage Substation	2.93	0.00
Bob Hope Dr. & Dinah Shore Dr. Substation Line Reconfiguration (Alternative Route 1) Starting from Mirage Substation	2.67	1.42
Bob Hope & Dinah Shore Dr. Substation Line Reconfiguration (Alternative Route 2) Starting from Mirage Substation	2.77	0.00
Gerald Ford Dr. & Portola Ave. Substation Line Reconfiguration (Alternative Route 1) Starting from Mirage Substation	0.00	2.02
Gerald Ford Dr. & Portola Ave. Substation Line Reconfiguration (Alternative Route 2) Starting from Mirage Substation	2.97	0.57

Notes

1. Based on detailed map of the area. Distances are approximate.

Table F-12. Equipment Exhaust During Transmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
TRANSMISSION LINE LOOP-IN									
Survey									
2	½-Ton Pick-Up	200	3	8	1.4	10.5	11.4	0.0	0.4
	Total Survey				**1.4**	**10.5**	**11.4**	**0.0**	**0.4**
Marshalling Yards									
1	1-Ton Crew Cab	300	85	2	0.1	0.6	0.1	0.0	0.0
1	30-Ton Crane	300	85	2	0.4	1.6	4.0	0.0	0.2
2	10,000-Pound Rough-Terrain Forklift	200	85	5	0.7	1.8	8.3	0.0	0.3
1	Truck, Semi-Tractor	350	85	1	0.1	0.4	1.3	0.0	0.1
	Total Marshalling Yards				**1.3**	**4.4**	**13.7**	**0.0**	**0.5**
Roads and Landing Work									
1	1-Ton Crew Cab	300	3	5	0.2	1.6	0.2	0.0	0.0
1	Road Grader	350	3	6	1.4	5.3	14.3	0.0	0.5
1	Track-Type Dozer	350	3	6	2.3	11.9	21.0	0.0	0.9
1	Drum-Type Compactor	250	3	6	1.5	4.2	16.9	0.0	0.6
3	Water Truck	350	3	10	3.2	12.3	40.1	0.0	1.9
1	Lowboy Truck & Trailer	250	3	4	0.4	1.6	5.3	0.0	0.3
1	Excavator	300	3	6	1.3	4.3	13.3	0.0	0.5
1	Front-End Loader	350	3	6	1.7	5.8	18.8	0.0	0.7
	Total Roads and Landing Work				**12.1**	**46.9**	**130.1**	**0.1**	**5.4**
Install Foundations									
4	1-Ton Crew Cab	300	17	6	0.8	7.6	0.8	0.0	0.1
2	30-Ton Crane	300	17	5	2.0	7.8	19.9	0.0	0.8
1	Front-End Loader	200	17	5	0.8	2.2	9.0	0.0	0.3
2	Diggers	500	17	8	4.6	15.3	50.2	0.1	1.8
2	4,000-Gallon Water Truck	350	17	5	1.1	4.1	13.4	0.0	0.6
6	Concrete Mixer Truck	425	17	5	3.2	12.3	40.1	0.0	1.9
	Total Install Foundations				**12.4**	**49.27**	**133.36**	**0.15**	**5.48**
Tower Legs Haul and Erect									
1	1-Ton Crew Cab	300	4	6	0.2	1.9	0.2	0.0	0.0
1	30-Ton Crane Truck	300	4	8	0.8	3.3	10.7	0.0	0.5
1	10,000-Pound Rough-Terrain Forklift	200	4	6	0.4	1.1	5.0	0.0	0.2
1	Truck & Trailer	350	4	5	0.5	2.0	6.7	0.0	0.3
1	10,000-Pound Rough-Terrain Forklift	200	5	8	0.6	1.5	6.7	0.0	0.2
2	Truck & Trailer	350	5	10	2.1	8.2	26.7	0.0	1.3
	Total Tower Legs Haul and Erect				**4.7**	**17.93**	**55.97**	**0.06**	**2.51**

Table F-12. Equipment Exhaust During Transmission Line Construction - Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Tower Assembly								
2 Rough-Terrain Crane	400	8	8	3.2	12.4	31.8	0.0	1.2
2 Crane Truck	300	8	8	1.7	6.5	21.4	0.0	1.0
2 Rough-Terrain Fork Lift	200	8	5	0.7	1.8	8.3	0.0	0.3
3 Pick-Up Truck	300	8	10	2.7	19.8	21.3	0.0	0.8
4 Crew Cab Flat-Bed	300	8	5	0.6	6.3	0.7	0.0	0.1
2 Compressor Truck	350	8	5	1.1	4.1	13.4	0.0	0.6
Total Tower Assembly				**10.0**	**50.94**	**96.90**	**0.10**	**3.99**
Tower TSP Erection								
1 Pick-Up Truck	300	8	5	0.4	3.3	3.6	0.0	0.1
2 Crew Cab Flat-Bed	300	8	5	0.3	3.2	0.3	0.0	0.0
1 Compressor Truck	350	8	5	0.5	2.0	6.7	0.0	0.3
1 Rough-Terrain Crane	500	8	6	1.2	4.7	11.9	0.0	0.5
Total Tower TSP Erection				**2.5**	**13.2**	**22.5**	**0.0**	**0.9**
Tower Removal								
1 Pick-Up Truck	300	4	8	0.7	5.3	5.7	0.0	0.2
1 Flat-Bed Truck	350	4	8	0.3	2.5	0.3	0.0	0.0
Total Tower Removal				**1.0**	**7.8**	**6.0**	**0.0**	**0.2**
Conductor Installation								
3 Crew Cab Flat-Bed Bed	300	10	8	0.8	7.6	0.8	0.0	0.1
2 Wire Truck & Trailer	350	6	2	0.4	1.6	5.3	0.0	0.3
1 Dump Truck (Trash)	350	10	2	0.2	0.8	2.7	0.0	0.1
1 Pick-Up Truck	300	10	10	0.9	6.6	7.1	0.0	0.3
2 Manitex	350	10	6	2.3	8.5	27.3	0.0	0.9
1 Manitex	350	10	8	1.6	5.7	18.2	0.0	0.6
2 Sleeving Rigs	350	10	2	0.6	2.3	8.1	0.0	0.3
1 Log Truck & Trailer	500	10	2	0.2	0.8	2.7	0.0	0.1
1 Rough-Terrain Fork Lift	350	10	2	0.1	0.4	1.7	0.0	0.1
1 580 Case Backhoe	120	6	2	0.2	0.7	1.3	0.0	0.1
4 Spacing Cart	10	6	4	0.2	1.0	1.2	0.0	0.1
1 Static Truck	350	6	2	0.2	0.8	2.7	0.0	0.1
1 Static Tensioner	0	6	2	0.0	0.1	0.1	0.0	0.0
2 3-Drum Strawline Puller	300	6	4	1.6	5.7	18.2	0.0	0.6
1 60lk Puller	525	6	3	0.6	2.1	6.8	0.0	0.2
1 Sag Cat with 2 Winches	350	6	2	0.4	1.4	4.6	0.0	0.2
4 D8 Cat	300	6	1	1.2	3.8	12.6	0.0	0.4
1 Hughes 500 E Helicopter	650	3	4	1.5	17.6	16.6	1.4	2.3
1 Fuel, Helicopter Support Truck	300	3	2	0.2	0.8	2.7	0.0	0.1
1 Low Boy Truck & Trailer	500	10	2	0.2	0.8	2.7	0.0	0.1
Total Conductor Installation				**13.4**	**69.1**	**143.3**	**1.5**	**7.0**

Table F-12. Equipment Exhaust During Transmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Restoration									
1	Crew Cab	300	4	5	0.2	1.6	0.2	0.0	0.0
1	Road Grader	350	4	6	1.4	5.3	14.3	0.0	0.5
1	Track-Type Dozer	350	4	6	2.3	11.9	21.0	0.0	0.9
1	Drum-Type Compactor	250	4	6	1.5	4.2	16.9	0.0	0.6
3	Water Trucks	350	4	10	3.2	12.3	40.1	0.0	1.9
1	Lowboy Truck & Trailer	500	4	4	0.4	1.6	5.3	0.0	0.3
1	Front End Loader	350	4	6	1.7	5.8	18.8	0.0	0.7
1	Excavator	300	4	6	1.3	4.3	13.3	0.0	0.5
Total Restoration					**12.1**	**46.9**	**130.1**	**0.1**	**5.4**
Maximum Daily Emissions FromTransmission Line Construction					**13.4**	**69.1**	**143.3**	**1.5**	**7.0**

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Table F-13. Transmission Line Emission Factors

Off-Road Construction Equipment		Emission Factors						Notes:
		HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
	Bore/Drill Rigs	350	0.1566	0.5631	2.0226	0.0031	0.0640	Used for drillers, and sleeve rigs
	Crushers/Process Equipment	250	0.2529	0.7004	2.8190	0.0028	0.0959	Used for compactors
		300	0.2012	0.7762	1.9878	0.0018	0.0771	
		400	0.2012	0.7762	1.9878	0.0018	0.0771	
	Cranes	500	0.2012	0.7762	1.9878	0.0018	0.0771	Used for cranes
	Excavators	300	0.2175	0.7092	2.2162	0.0023	0.0803	Used for excavators
		200	0.0716	0.1822	0.8315	0.0009	0.0254	
	Forklifts	350	0.0716	0.1822	0.8315	0.0009	0.0254	Used for forklifts
	Graders	350	0.2360	0.8828	2.3908	0.0023	0.0904	Used for graders
		0	0.0119	0.0617	0.0750	0.0002	0.0046	
		10	0.0119	0.0617	0.0750	0.0002	0.0046	
		300	0.1944	0.7066	2.2771	0.0025	0.0770	
		350	0.1944	0.7066	2.2771	0.0025	0.0770	
	Other Construction Equipment	525	0.1944	0.7066	2.2771	0.0025	0.0770	Used for manitex, spacing carts, pullers, and tensioners
	Other General Industrial Equipment	650	0.4552	1.5794	4.8663	0.0044	0.1724	
		300	0.3895	1.9869	3.5050	0.0026	0.1495	
	Rubber-Tired Dozers	350	0.3895	1.9869	3.5050	0.0026	0.1495	Used for dozers
		120	0.1083	0.3703	0.6510	0.0006	0.0595	
		200	0.1598	0.4453	1.7937	0.0019	0.0598	
		300	0.2897	0.9591	3.1387	0.0039	0.1102	
		350	0.2897	0.9591	3.1387	0.0039	0.1102	
	Tractors/Loaders/Backhoes	500	0.2897	0.9591	3.1387	0.0039	0.1102	Used for all backhoes, excavators, loaders & ditch diggers

Source: SCAQMD Air Quality Handbook, Off-Road Emissions Sources - (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

	HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
Helicopters	650	0.3677	4.4054	4.1474	0.3483	0.5805	Used for helicopters

Source: EPA 420-R-92-009 - Procedures for Emission Inventory Preparation, Volume IV, Mobile Sources, December 1992

- (http://www.ntl.bts.gov/docs/AQP.html - Table 5-7, Pg. 185)

On-Road Vehicles

	HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
Crew & Foreman Trucks (Suburbans) (pounds/mile x 30 miles/hour)	Composite	0.032376	0.316453	0.033086	0.000323	0.002552	Used 'passenger vehicle' emfac
Pick-Up Trucks (pounds/mile) x 30 miles/hour	Composite	0.089781	0.658475	0.711377	0.00077	0.025682	Used 'delivery trucks' emfac
Heavy Duty Trucks and Truck-Mounted Equipment (pounds/mile) x 30 miles/hour	Composite	0.105474	0.40841	1.337405	0.001241	0.064691	Used 'heavy-heavy-duty trucks' emfac

Source: SCAQMD Air Quality Handbook, Emfac2007 (Ver2.3) Emission Factors (On-Road), Scenario Year 2008 - http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

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Table F-14. Equipment Exhaust During Subtransmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Subtransmission Lines									
	Survey								
1	½-Ton Pick-Up Truck, 4X4	200	3	10	0.9	6.6	7.1	0.0	0.3
	Total Survey				**0.9**	**6.6**	**7.1**	**0.0**	**0.3**
	Roads								
2	1-Ton Crew Cab, 4X4	300	10	2	0.1	1.3	0.1	0.0	0.0
1	Road Grader	350	10	10	2.4	8.8	23.9	0.0	0.9
2	Track Type Dozer	350	10	2.5	1.9	9.9	17.5	0.0	0.7
1	Water Truck	350	10	10	1.1	4.1	13.4	0.0	0.6
	Total Roads				**5.5**	**24.1**	**54.9**	**0.0**	**2.3**
	Pole Framing and Setting								
2	¾-Ton Suburban	300	147	10	0.6	6.3	0.7	0.0	0.1
2	5-Ton Framing Truck, 4X4	350	83	10	2.1	8.2	26.7	0.0	1.3
2	30-Ton Line Truck	350	83	10	2.1	8.2	26.7	0.0	1.3
1	Digger Truck	500	24	10	1.1	4.1	13.4	0.0	0.6
1	Water Truck	350	83	10	1.1	4.1	13.4	0.0	0.6
2	Backhoe	350	147	10	5.8	19.2	62.8	0.1	2.2
2	Bucket Truck	350	147	10	2.1	8.5	27.3	0.0	1.0
2	Truck Mounted Crane	350	147	10	2.1	8.2	26.7	0.0	1.3
1	30-Ton Crane	500	14	10	2.0	7.8	19.9	0.0	0.8
1	Cement Truck	350	3	10	1.1	4.1	13.4	0.0	0.6
	Total Pole Framing and Setting				**20.1**	**78.5**	**230.9**	**0.2**	**9.8**
	Material Delivery								
2	60-Foot Flat-Bed Pole Truck	350	5	8	1.7	6.5	21.4	0.0	1.0
1	Forklift	200	5	8	0.6	1.5	6.7	0.0	0.2
	Total Material Delivery				**2.3**	**8.0**	**28.1**	**0.0**	**1.2**
	Conductor Installation								
1	Flat-Bed Truck & Trailer (Wire Puller)	300	24	6	0.6	2.5	8.0	0.0	0.4
1	Flat-Bed Truck & Trailer (Wire Dolly)	300	24	6	0.6	2.5	8.0	0.0	0.4
2	30-Ton Line Truck	300	24	5	1.1	4.1	13.4	0.0	0.6
2	¾-Ton Suburban	300	14	10	0.6	6.3	0.7	0.0	0.1
1	Water Truck	350	24	10	1.1	4.1	13.4	0.0	0.6
2	Bucket Truck	350	24	6	1.3	4.9	16.0	0.0	0.8
2	Truck Mounted Crane	350	24	6	1.3	4.9	16.0	0.0	0.8
	Total Conductor Installation				**6.6**	**29.2**	**75.6**	**0.1**	**3.7**
	Restoration								
2	1-Ton Crew Cab, 4X4	300	40	8	0.5	5.1	0.5	0.0	0.0
1	Water Truck	350	40	8	0.8	3.3	10.7	0.0	0.5
	Total Restoration				**1.4**	**8.3**	**11.2**	**0.0**	**0.6**

Table F-14. Equipment Exhaust During Subtransmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
	Maximum Daily Emissions From Subtransmission Line Construction				**20.1**	**78.5**	**230.9**	**0.2**	**9.8**
Mirage Substation									
	Civil								
1	Driller	Composite	50	8	1.0	4.2	10.7	0.0	0.5
2	Crew Truck	Composite	80	2	0.1	1.3	0.1	0.0	0.0
1	14-Ton Crane	Composite	25	4	0.7	2.4	6.4	0.0	0.3
1	Dump Truck	Composite	75	6	0.6	2.5	8.0	0.0	0.4
1	Tractor	Composite	75	6	0.7	2.4	4.6	0.0	0.4
1	5-Ton Truck	Composite	15	4	0.4	1.6	5.3	0.0	0.3
1	Forklift	Composite	75	4	0.3	1.0	2.4	0.0	0.1
1	Ditch Digger	Composite	55	6	1.0	3.5	7.9	0.0	0.4
	Total Civil				**5.0**	**18.9**	**45.7**	**0.0**	**2.3**
	Electrical								
2	Manlift	Composite	100	6	0.9	2.6	4.7	0.0	0.3
1	Pick-Up Truck	Composite	110	2	0.2	1.3	1.4	0.0	0.1
1	14-Ton Crane Truck	Composite	90	6	0.6	2.5	8.0	0.0	0.4
2	Crew Truck	Composite	110	2	0.1	1.3	0.1	0.0	0.0
1	150-Ton Crane	Composite	60	6	1.1	3.6	9.7	0.0	0.4
1	5-Ton Truck	Composite	50	2	0.2	0.8	2.7	0.0	0.1
1	Forklift	Composite	100	6	0.5	1.5	3.6	0.0	0.2
2	Carryall Vehicle	Composite	110	2	0.4	1.6	5.3	0.0	0.3
1	Support Truck	Composite	25	2	0.2	0.8	2.7	0.0	0.1
	Total Electrical				**4.2**	**16.0**	**38.2**	**0.0**	**1.9**
	Transformer Installation								
2	Carryall Vehicle	Composite	22	6	1.3	4.9	16.0	0.0	0.8
1	Manlift	Composite	20	6	0.4	1.3	2.3	0.0	0.2
1	Forklift	Composite	22	6	0.5	1.5	3.6	0.0	0.2
1	50-Ton Crane	Composite	15	6	1.1	3.6	9.7	0.0	0.4
2	Crew Truck	Composite	22	2	0.1	1.3	0.1	0.0	0.0
	Total Transformer Installation				**3.4**	**12.5**	**31.8**	**0.0**	**1.6**
	Maintenance								
1	Foreman Truck	Composite	40	2	0.1	0.6	0.1	0.0	0.0
1	Manlift	Composite	40	6	0.4	1.3	2.3	0.0	0.2
2	Crew Truck	Composite	110	2	0.1	1.3	0.1	0.0	0.0
	Total Maintenance				**0.6**	**3.2**	**2.5**	**0.0**	**0.2**
	Test								
1	Pick-Up Truck	Composite	110	2	0.2	1.3	1.4	0.0	0.1
	Total Test				**0.2**	**1.3**	**1.4**	**0.0**	**0.1**
	Total Mirage Substation				**13.43**	**51.96**	**119.57**	**0.12**	**6.05**

Table F-14. Equipment Exhaust During Subtransmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Concho Substation									
	Electrical								
1	Carryall Vehicle	Composite	34	2	0.2	0.8	2.7	0.0	0.1
	Test								
1	Pick-Up Truck	Composite	34	2	0.2	1.3	1.4	0.0	0.1
	Total Concho Substation				**0.39**	**2.13**	**4.10**	**0.00**	**0.18**
Indian Wells Substation									
	Electrical								
1	Carryall Vehicle	Composite	50	2	0.2	0.8	2.7	0.0	0.1
	Test								
1	Pick-Up Truck	Composite	50	2	0.2	1.3	1.4	0.0	0.1
	Total Indian Wells Substation				**0.4**	**2.1**	**4.1**	**0.0**	**0.2**
Santa Rosa Substation									
	Electrical								
1	Carryall Vehicle	Composite	40	2	0.2	0.8	2.7	0.0	0.1
	Test								
1	Pick-Up Truck	Composite	40	2	0.2	1.3	1.4	0.0	0.1
	Total Santa Rosa Substation				**0.4**	**2.1**	**4.1**	**0.0**	**0.2**
Devers Substation									
	Civil								
1	Driller	Composite	2	8	1.0	4.2	10.7	0.0	0.5
1	Crew Truck	Composite	5	2	0.1	0.6	0.1	0.0	0.0
1	Dump Truck	Composite	5	6	0.6	2.5	8.0	0.0	0.4
1	Tractor	Composite	5	6	0.7	2.4	4.6	0.0	0.4
	Total Civil				**2.5**	**9.7**	**23.5**	**0.0**	**1.2**
	Electrical								
1	Manlift	Composite	45	6	0.4	1.3	2.3	0.0	0.2
1	Pick-Up Truck	Composite	60	2	0.2	1.3	1.4	0.0	0.1
1	Crew Truck	Composite	60	2	0.1	0.6	0.1	0.0	0.0
1	150-Ton Crane	Composite	10	6	1.1	3.6	9.7	0.0	0.4
1	Forklift	Composite	40	6	0.5	1.5	3.6	0.0	0.2
1	Carryall Vehicle	Composite	60	2	0.2	0.8	2.7	0.0	0.1
	Total Electrical				**2.4**	**9.1**	**19.7**	**0.0**	**1.0**

Table F-14. Equipment Exhaust During Subtransmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Maintenance									
1	Foreman Truck	Composite	5	2	0.1	0.6	0.1	0.0	0.0
1	Crew Truck	Composite	10	2	0.1	0.6	0.1	0.0	0.0
Total Maintenance					**0.1**	**1.3**	**0.1**	**0.0**	**0.0**
Test									
1	Pick-Up Truck	Composite	20	2	0.2	1.3	1.4	0.0	0.1
Total Test					**0.2**	**1.3**	**1.4**	**0.0**	**0.1**
Total Devers Substation					**5.2**	**21.5**	**44.8**	**0.0**	**2.3**
Eisenhower Substation									
Civil									
1	Driller	Composite	5	8	1.0	4.2	10.7	0.0	0.5
1	Crew Truck	Composite	15	2	0.1	0.6	0.1	0.0	0.0
1	Dump Truck	Composite	15	6	0.6	2.5	8.0	0.0	0.4
1	Tractor	Composite	15	6	0.7	2.4	4.6	0.0	0.4
1	Ditch Digger	Composite	5	6	1.0	3.5	7.9	0.0	0.4
Total Civil					**3.5**	**13.2**	**31.4**	**0.0**	**1.7**
Electrical									
1	Manlift	Composite	35	6	0.4	1.3	2.3	0.0	0.2
1	Crew Truck	Composite	45	2	0.1	0.6	0.1	0.0	0.0
1	150-Ton Crane	Composite	20	6	1.1	3.6	9.7	0.0	0.4
1	Forklift	Composite	45	6	0.5	1.5	3.6	0.0	0.2
1	Carryall Vehicle	Composite	45	2	0.2	0.8	2.7	0.0	0.1
Total Electrical					**2.3**	**7.8**	**18.3**	**0.0**	**0.9**
Maintenance									
1	Foreman Truck	Composite	5	2	0.1	0.6	0.1	0.0	0.0
1	Crew Truck	Composite	10	2	0.1	0.6	0.1	0.0	0.0
Total Maintenance					**0.1**	**1.3**	**0.1**	**0.0**	**0.0**
Test									
1	Pick-Up Truck	Composite	45	2	0.2	1.3	1.4	0.0	0.1
Total Test					**0.2**	**1.3**	**1.4**	**0.0**	**0.1**
Total Eisenhower Substation					**6.1**	**23.7**	**51.3**	**0.1**	**2.6**

Table F-14. Equipment Exhaust During Subtransmission Line Construction - Exhaust Emissions									
	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Farrell Substation									
	Civil								
1	Driller	Composite	10	8	1.0	4.2	10.7	0.0	0.5
1	Crew Truck	Composite	20	2	0.1	0.6	0.1	0.0	0.0
1	Dump Truck	Composite	20	6	0.6	2.5	8.0	0.0	0.4
1	Tractor	Composite	20	6	0.7	2.4	4.6	0.0	0.4
1	Ditch Digger	Composite	10	6	1.0	3.5	7.9	0.0	0.4
Total Civil					**3.5**	**13.2**	**31.4**	**0.0**	**1.7**
	Electrical								
1	Manlift	Composite	40	6	0.4	1.3	2.3	0.0	0.2
1	Crew Truck	Composite	55	2	0.1	0.6	0.1	0.0	0.0
1	150-Ton Crane	Composite	25	6	1.1	3.6	9.7	0.0	0.4
1	Forklift	Composite	55	6	0.5	1.5	3.6	0.0	0.2
1	Carryall Vehicle	Composite	55	2	0.2	0.8	2.7	0.0	0.1
Total Electrical					**2.3**	**7.8**	**18.3**	**0.0**	**0.9**
	Maintenance								
1	Foreman Truck	Composite	5	2	0.1	0.6	0.1	0.0	0.0
1	Crew Truck	Composite	10	2	0.1	0.6	0.1	0.0	0.0
Total Maintenance					**0.1**	**1.3**	**0.1**	**0.0**	**0.0**
	Test								
1	Pick-Up Truck	Composite	55	2	0.2	1.3	1.4	0.0	0.1
Total Test					**0.2**	**1.3**	**1.4**	**0.0**	**0.1**
Total Farrell Substation					**6.1**	**23.7**	**51.3**	**0.1**	**2.6**
Garnet Substation									
	Electrical								
1	Carryall Vehicle	Composite	16	2	0.2	0.8	2.7	0.0	0.1
	Test								
1	Pick-Up Truck	Composite	16	2	0.2	1.3	1.4	0.0	0.1
Total Garnet Substation					**0.4**	**2.1**	**4.1**	**0.0**	**0.2**
Thornhill Substation									
	Electrical								
1	Carryall Vehicle	Composite	40	2	0.2	0.8	2.7	0.0	0.1
	Test								
1	Pick-Up Truck	Composite	40	2	0.2	1.3	1.4	0.0	0.1
Total Thornhill Substation					**0.4**	**2.1**	**4.1**	**0.0**	**0.2**

Table F-14. Equipment Exhaust During Subtransmission Line Construction - Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Tamarisk Substation									
Civil									
1	Crew Truck	Composite	5	2	0.1	0.6	0.1	0.0	0.0
1	Dump Truck	Composite	5	6	0.6	2.5	8.0	0.0	0.4
1	Tractor	Composite	5	6	0.7	2.4	4.6	0.0	0.4
Total Civil					**1.4**	**5.5**	**12.7**	**0.0**	**0.8**
Electrical									
1	Manlift	Composite	5	6	0.4	1.3	2.3	0.0	0.2
1	Pick-Up Truck	Composite	40	2	0.2	1.3	1.4	0.0	0.1
1	Crew Truck	Composite	40	2	0.1	0.6	0.1	0.0	0.0
1	150-Ton Crane	Composite	2	6	1.1	3.6	9.7	0.0	0.4
1	Forklift	Composite	5	6	0.5	1.5	3.6	0.0	0.2
1	Carryall Vehicle	Composite	40	2	0.2	0.8	2.7	0.0	0.1
Total Electrical					**2.4**	**9.1**	**19.7**	**0.0**	**1.0**
Maintenance									
1	Foreman Truck	Composite	1	2	0.1	0.6	0.1	0.0	0.0
2	Crew Truck	Composite	2	2	0.1	1.3	0.1	0.0	0.0
Total Maintenance					**0.2**	**1.9**	**0.2**	**0.0**	**0.0**
Test									
1	Pick-Up Truck	Composite	30	2	0.2	1.3	1.4	0.0	0.1
Total Test					**0.2**	**1.3**	**1.4**	**0.0**	**0.1**
Total Tamarisk Substation					**4.2**	**17.9**	**34.1**	**0.0**	**1.8**

Note: Each simultaneous construction phase is calculated separately. Maximum daily emissions are for each construction segment are the maximum daily simultaneous emissions and are bold, italicized, and underlined.

Table F-15. Subtransmission Line Emission Factors

Off-Road Construction Equipment

	Emission Factors						Notes:
	HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
Aerial Lifts	Composite	0.0746	0.2200	0.3885	0.0004	0.0269	Used for manlifts
Bore/Drill Rigs	Composite	0.1295	0.5281	1.3416	0.0017	0.0591	Used for drillers, and sleeve rigs
Cranes	500	0.2012	0.7762	1.9878	0.0018	0.0771	
	Composite	0.1778	0.6011	1.6100	0.0014	0.0715	Used for all cranes
Excavators	Composite	0.1695	0.5828	1.3249	0.0013	0.0727	Used for excavators and ditch diggers
Forklifts	200	0.0716	0.1822	0.8315	0.0009	0.0254	
	Composite	0.0799	0.2422	0.5982	0.0006	0.0324	Used for forklifts
Graders	350	0.2360	0.8828	2.3908	0.0023	0.0904	Used for graders
Off-Highway Trucks	Composite	0.2730	0.8499	2.7256	0.0027	0.0989	Used for all diesel trucks & carryall vehicles
Other Material Handling Equipment	Composite	0.1952	0.6041	1.7655	0.0015	0.0786	Used for cable puller & conductor tensioner
Other Construction Equipment	Composite	0.1215	0.4504	1.1575	0.0013	0.0503	Used for cable dollies
Rubber-Tired Dozers	350	0.3895	1.9869	3.5050	0.0026	0.1495	Used for dozers
Tractors/Loaders/Backhoes	350	0.2897	0.9591	3.1387	0.0039	0.1102	
	Composite	0.1204	0.4063	0.7746	0.0008	0.0599	Used for all backhoes & ditch diggers

Source: SCAQMD Air Quality Handbook, Off-Road Emissions Sources - (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

On-Road Vehicles

	HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
Crew & Foreman Trucks (Suburbans) (pounds/mile x 30 miles/hour)	Composite	0.032376	0.316453	0.033086	0.000323	0.002552	Used 'passenger vehicle' emfac
Pickup Trucks (pounds/mile) x 30 miles/hour	Composite	0.089781	0.658475	0.711377	0.00077	0.025682	Used 'delivery trucks' emfac
Heavy Duty Trucks and Truck-Mounted Equipment (pounds/mile) x 30 miles/hour	Composite	0.105474	0.40841	1.337405	0.001241	0.064691	Used 'heavy-heavy-duty trucks' emfac

Source: SCAQMD Air Quality Handbook, Emfac2007 (Ver2.3) Emission Factors (On-Road), Scenario Year 2008 - http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

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Table F-16. Equipment Exhaust During Telecommunication Construction - Exhaust Emissions

Construction Phase	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Mirage-Santa Rosa								
Cable Construction								
2 Bucket Truck	Composite	5	8	1.7	6.5	21.4	0.0	1.0
1 Pick-Up	Composite	5	8	0.0	0.2	0.2	0.0	0.0
1 2-Axle Trailer	Composite	5	8	1.6	4.8	14.1	0.0	0.6
Total Cable Construction				**3.3**	**11.5**	**35.7**	**0.0**	**1.7**
Receive and Loadout								
1 5-Ton Forklift	Composite	1	8	0.6	1.9	4.8	0.0	0.3
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Receive and Loadout				**0.7**	**2.1**	**5.0**	**0.0**	**0.3**
Clean-Up								
2 Bucket Truck	Composite	1	8	1.7	6.5	21.4	0.0	1.0
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**1.7**	**6.7**	**21.6**	**0.0**	**1.0**
Total Mirage Santa Rosa				**5.65**	**20.37**	**62.28**	**0.06**	**2.98**
Farrell-Garnet								
Cable Construction								
2 Bucket Truck	Composite	18	8	1.7	6.5	21.4	0.0	1.0
1 Pick-Up	Composite	18	8	0.0	0.2	0.2	0.0	0.0
1 2-Axle Trailer	Composite	18	8	1.6	4.8	14.1	0.0	0.6
Total Cable Construction				**3.3**	**11.5**	**35.7**	**0.0**	**1.7**
Receive and Loadout								
1 5-Ton Forklift	Composite	1	8	0.6	1.9	4.8	0.0	0.3
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Receive and Loadout				**0.7**	**2.1**	**5.0**	**0.0**	**0.3**
Clean-Up								
2 Bucket Truck	Composite	1	8	1.7	6.5	21.4	0.0	1.0
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**1.7**	**6.7**	**21.6**	**0.0**	**1.0**
Total Farrel Garnet				**5.65**	**20.37**	**62.28**	**0.06**	**2.98**
Devers								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**

Table F-16. Equipment Exhaust During Telecommunication Construction - Exhaust Emissions

Construction Phase	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Devers				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**
Mirage								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Mirage				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**
Tamarisk								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Tamarisk				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**
Eisenhower								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Eisenhower				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**

Table F-16. Equipment Exhaust During Telecommunication Construction - Exhaust Emissions

Construction Phase	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Concho								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Concho				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**
Indian Wells								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Indian Wells				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**
Santa Rosa								
Equipment Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Cable Construction				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Circuit Installation								
2 Pick-Up	Composite	6	8	0.0	0.4	0.4	0.0	0.0
Total Circuit Installation				**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Santa Rosa				**0.12**	**0.88**	**0.95**	**0.00**	**0.03**

Table F-16. Equipment Exhaust During Telecommunication Construction - Exhaust Emissions

Construction Phase	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
Thornhill								
Equipment Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Cable Construction				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Circuit Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Circuit Installation				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Thornhill				**0.07**	**0.53**	**0.57**	**0.00**	**0.02**
Garnet								
Equipment Installation								
1 Pick-up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Cable Construction				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Circuit Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Circuit Installation				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Garnet				**0.07**	**0.53**	**0.57**	**0.00**	**0.02**
Farrell								
Equipment Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Cable Construction				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Circuit Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Circuit Installation				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Farrell				**0.07**	**0.53**	**0.57**	**0.00**	**0.02**

Table F-16. Equipment Exhaust During Telecommunication Construction - Exhaust Emissions

Construction Phase	HP	Duration (days)	Usage (hour/day)	ROG Emissions (lb/day)	CO Emissions (lb/day)	NOX Emissions (lb/day)	SOX Emissions (lb/day)	PM10 Emissions (lb/day)
EDOM Hill								
Equipment Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Cable Construction				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Circuit Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Circuit Installation				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total EDOM Hills				**0.07**	**0.53**	**0.57**	**0.00**	**0.02**
Palm Springs								
Equipment Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Cable Construction				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Circuit Installation								
1 Pick-Up	Composite	6	8	0.0	0.2	0.2	0.0	0.0
Total Circuit Installation				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Clean-Up								
1 Pick-Up	Composite	1	8	0.0	0.2	0.2	0.0	0.0
Total Clean-Up				**0.0**	**0.2**	**0.2**	**0.0**	**0.0**
Total Palm Springs				**0.07**	**0.53**	**0.57**	**0.00**	**0.02**
MAX DAILY EMISSIONS DURING CONSTRUCTION				**5.6**	**20.4**	**62.3**	**0.1**	**3.0**

Note: Each simultaneous construction phase is calculated separately. Maximum daily emissions are for each construction segment are the maximum daily simultaneous emissions and are bold, italicized, and underlined. Annual emissions are the sum of all construction phases.

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Table F-17. Telecommunication Equipment Emission Factors

Off-Road Construction Equipment	Emission Factors						Notes:
	HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
Forklifts	Composite	0.0799	0.2422	0.5982	0.0006	0.0324	Used for forklifts
Off-Highway Trucks	Composite	0.2730	0.8499	2.7256	0.0027	0.0989	Used for all diesel trucks & carryall vehicles
Other Material Handling Equipment	Composite	0.1952	0.6041	1.7655	0.0015	0.0786	Used for cable puller & conductor tensioner

Source: SCAQMD Air Quality Handbook, Off-Road Emissions Sources - (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

On-Road Vehicles

	HP (hp)	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	
Crew & Foreman Trucks (Suburbans) (pounds/mile x 30 miles/hour)	Composite	0.001079	0.010548	0.001103	1.08E-05	0.000085	Used 'passenger vehicle' emfac
Pickup Trucks (pounds/mile) x 30 miles/hour	Composite	0.002993	0.021949	0.023713	2.57E-05	0.000856	Used 'delivery trucks' emfac
Heavy Duty Trucks and Truck-Mounted Equipment (pounds/miles) x 30 miles/hour	Composite	0.105474	0.40841	1.337405	0.001241	0.064691	Used 'heavy-heavy-duty trucks' emfac

Source: SCAQMD Air Quality Handbook, Emfac2007 (Ver2.3) Emission Factors (On-Road), Scenario Year 2008 - http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

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Table F-18. Maximum Project CO2 Emissions Summary

Construction Phase	Maximum Emissions (tons/project) CO2
Transmission Line Loop-In [1]	
On-Site Vehicle Exhaust	356.27
Employee Vehicles	19.31
Total	375.58
Subtransmission Line [2]	
On-Site Vehicle Exhaust	1377.29
Employee Vehicles	141.32
Total	1518.62
Devers Substation Construction	
On-Site Vehicle Exhaust	36.03
Employee Vehicles	12.05
Total	48.09
Mirage Substation Construction	
On-Site Vehicle Exhaust	319.04
Employee Vehicles	128.29
Total	447.33
Concho Substation Construction	
On-Site Vehicle Exhaust	7.07
Employee Vehicles	3.72
Total	10.79
Indian Wells Substation Construction	
On-Site Vehicle Exhaust	10.40
Employee Vehicles	5.48
Total	15.87
Santa Rosa Substation Construction	
On-Site Vehicle Exhaust	8.32
Employee Vehicles	4.38
Total	12.70
Eisenhower Substation Construction	
On-Site Vehicle Exhaust	44.32
Employee Vehicles	12.05
Total	56.37
Farrell Substation Construction	
On-Site Vehicle Exhaust	58.97
Employee Vehicles	15.89
Total	74.85

Table F-18. Maximum Project CO2 Emissions Summary

Construction Phase	Maximum Emissions (tons/project) CO2
Garnet Substation Construction	
On-Site Vehicle Exhaust	3.33
Employee Vehicles	1.75
Total	5.08
Thornhill Substation Construction	
On-Site Vehicle Exhaust	8.32
Employee Vehicles	4.38
Total	12.70
Tamarisk Substation Construction	
On-Site Vehicle Exhaust	17.42
Employee Vehicles	14.05
Total	31.47
Telecommunications Line	
On-Site Vehicle Exhaust	125.82
Employee Vehicles	14.05
Total	139.87
Project Total Emissions	**2749.31**

Table F-19. Employee Vehicle - CO2 Exhaust Emissions

Employee Vehicle Emissions

Emission Factors
from SCAQMD Highest (Most Conservative) EMFAC 2007 Emission Factors for On-Road Passenger Vehicles and Delivery Trucks

E=F* VMT*DAYS/2000
F = Emission factor per passenger vehicle (lb/VMT)
VMT = Vehicle Miles Traveled

VMT per employee =	50	miles (assumed)

DAYS = Employee-days traveling to/from project
E = Emissions tons/project
Emission Factors for 2008 (lb/VMT)

CO2 =	1.09553

Emission Summary

Construction Phase	Employee-days per project*	CO2 (tons/project)
Transmission Line Loop-In	705	19.31
Subtransmission Lines	5160	141.32
Devers Substation	440	12.05
Mirage Substation	4684	128.29
Concho Substation	136	3.72
Indian Wells Substation	200	5.48
Santa Rosa Substation	160	4.38
Eisenhower Substation	440	12.05
Farrell Substation	580	15.89
Garnet Substation	64	1.75
Thornhill Substation	160	4.38
Tamarisk Substation	195	5.34
Telecommunication	513	14.05
Total Emissions		**368.02**

* Computed by calculating the person-days for each activity with the construction phase and summing over all activities.

Table F-20. Subtransmission Line Construction - Route Details

Route	Distance (Miles)	
	Paved	Unpaved
Farrell-Garnet (Alternative Route 1) Starting from Devers Substation	6.00	2.33
Farrell-Garnet (Alternative Route 2) Starting from Devers Substation	4.60	4.77
Farrell-Garnet (Alternative Route 3) Starting from Devers Substation	7.00	2.33
Devers Coachella Loo Starting from Mirage Substation	0.00	0.95
Mirage-Santa Rosa (Alternative Route 1) Starting from Mirage Substation	0.00	1.42
Mirage-Santa Rosa (Alternative Route 2) Starting from Mirage Substation	2.93	0.00
Bob Hope Dr. & Dinah Shore Dr. Substation Line Reconfiguration (Alternative Route 1) Starting from Mirage Substation	2.67	1.42
Bob Hope Dr. & Dinah Shore Dr. Substation Line Reconfiguration (Alternative Route 2) Starting from Mirage Substation	2.77	0.00
Gerald Ford Dr. & Portola Ave. Substation Line Reconfiguration (Alternative Route 1) Starting from Mirage Substation	0.00	2.02
Gerald Ford Dr. & Portola Ave. Substation Line Reconfiguration (Alternative Route 2) Starting from Mirage Substation	2.97	0.57

Notes

1. Based on detailed map of the area. Distances are approximate.

Table F-21. Equipment Exhaust During Transmission Line Construction - CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (pounds/day)	CO2 Emissions (tons/project)
TRANSMISSION LINE LOOP-IN						
Survey						
2	½-Ton Pick-Up	200	3	8	1305.3	2.0
Total Survey					**1305.3**	**2.0**
Marshalling Yards						
1	1-Ton Crew Cab	300	85	2	66.0	2.8
1	30-Ton Crane	300	85	2	360.2	15.3
2	10,000-Pound Rough-Terrain Forklift	200	85	5	771.0	32.8
1	Truck, Semi-Tractor	350	85	1	126.3	5.4
Total Marshalling Yards					**1323.5**	**56.2**
Roads and Landing Work						
1	1-Ton Crew Cab	300	3	5	164.9	0.2
1	Road Grader	350	3	6	1377.0	2.1
1	Track-Type Dozer	350	3	6	1589.4	2.4
1	Drum-Type Compactor	250	3	6	1467.0	2.2
3	Water Truck	350	3	10	3789.6	5.7
1	Lowboy Truck & Trailer	250	3	4	505.3	0.8
1	Excavator	300	3	6	1402.2	2.1
1	Front End Loader	350	3	6	2069.4	3.1
Total Roads and Landing Work					**12364.8**	**18.5**
Install Foundations						
4	1-Ton Crew Cab	300	17	6	791.7	6.7
2	30-Ton Crane	300	17	5	1801.0	15.3
1	Front End Loader	200	17	5	858.5	7.3
2	Digger	500	17	8	5518.4	46.9

Table F-21. Equipment Exhaust During Transmission Line Construction - CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (pounds/day)	CO2 Emissions (tons/project)
2	4,000 Gallon Water Truck	350	17	5	1263.2	10.7
6	Concrete Mixer Truck	425	17	5	3789.6	32.2
Total Install Foundations					**14022.37**	**119.19**
Tower Legs Haul and Erect						
1	Ton Crew Cab	300	4	6	197.9	0.4
1	30-Ton Crane Truck	300	4	8	1010.6	2.0
1	10,000-Pound Rough-Terrain Forklift	200	4	6	462.6	0.9
1	Truck & Trailer	350	4	5	631.6	1.3
1	10,000-Pound Rough-Terrain Forklift	200	5	8	616.8	1.5
2	Truck & Trailer	350	5	10	2526.4	6.3
Total Tower Legs Haul and Erect					**5445.88**	**12.46**
Tower Assembly						
2	Rough-Terrain Crane	400	8	8	2881.6	11.5
2	Crane Truck	300	8	8	2021.1	8.1
2	Rough-Terrain Fork Lift	200	8	5	771.0	3.1
3	Pick-Up Truck	300	8	10	2447.5	9.8
4	Crew Cab Flat-Bed	300	8	5	659.7	2.6
2	Compressor Truck	350	8	5	1263.2	5.1
Total Tower Assembly					**10044.13**	**40.18**

Table F-21. Equipment Exhaust During Transmission Line Construction - CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (pounds/day)	CO2 Emissions (tons/project)
Tower TSP Erection						
1	Pick-Up Truck	300	8	5	407.9	1.6
2	Crew Cab Flat-Bed	300	8	5	329.9	1.3
1	Compressor Truck	350	8	5	631.6	2.5
1	Rough-Terrain Crane	500	8	6	1080.6	4.3
Total Tower TSP Erection					**2450.0**	**9.8**
Tower Removal						
1	Pick-Up Truck	300	4	8	652.7	1.3
1	Flat-Bed Truck	350	4	8	263.9	0.5
Total Tower Removal					**916.6**	**1.8**
Conductor Installation						
3	Crew Cab Flat-Bed Bed	300	10	8	791.7	4.0
2	Wire Truck & Trailer	350	6	2	505.3	1.5
1	Dump Truck (Trash)	350	10	2	252.6	1.3
1	Pick-Up Truck	300	10	10	815.8	4.1
2	Manitex	350	10	6	3050.4	15.3
1	Manitex	350	10	8	2033.6	10.2
2	Sleeving Rigs	350	10	2	1245.2	6.2
1	Log Truck & Trailer	500	10	2	252.6	1.3
1	Rough-Terrain Fork Lift	350	10	2	154.2	0.8
1	580 Case Backhoe	120	6	2	103.4	0.3
4	Spacing Cart	10	6	4	161.6	0.5
1	Static Truck	350	6	2	252.6	0.8
1	Static Tensioner	0	6	2	20.2	0.1
2	3-Drum Strawline Puller	300	6	4	2033.6	6.1
1	60lk Puller	525	6	3	762.6	2.3
1	Sag Cat with 2 Winches	350	6	2	508.4	1.5

Table F-21. Equipment Exhaust During Transmission Line Construction - CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (pounds/day)	CO2 Emissions (tons/project)
4	D8 Cat	300	6	1	1379.6	4.1
1	Hughes 500 E Helicopter	650	3	4	6343.8	9.5
1	Fuel, Helicopter Support Truck	300	3	2	252.6	0.4
1	Lowboy Truck & Trailer	500	10	2	252.6	1.3
Total Conductor Installation					**21172.6**	**71.3**
Restoration						
1	Crew Cab	300	4	5	164.9	0.3
1	Road Grader	350	4	6	1377.0	2.8
1	Track-Type Dozer	350	4	6	1589.4	3.2
1	Drum-Type Compactor	250	4	6	1467.0	2.9
3	Water Truck	350	4	10	3789.6	7.6
1	Lowboy Truck & Trailer	500	4	4	505.3	1.0
1	Front End Loader	350	4	6	2069.4	4.1
1	Excavator	300	4	6	1402.2	2.8
Total Restoration					**12364.8**	**24.7**
Maximum Daily Emissions from Transmission Line Construction						**356.3**

Table F-22. Transmission Line Emission Factors

Off-Road Construction Equipment	Emission Factor HP (hp)	Emission Factor CO2 (lb/hr)	Notes:
Bore/Drill Rigs	350	311.3000	Used for drillers and sleeve rigs
Crushers/Process Equipment	250	244.5000	Used for compactors
	300	180.1000	
	400	180.1000	
Cranes	500	180.1000	Used for cranes
Excavators	300	233.7000	Used for excavators
	200	77.1000	
Forklifts	350	77.1000	Used for forklifts
Graders	350	229.5000	Used for graders
	0	10.1000	
	10	10.1000	
	300	254.2000	
	350	254.2000	
Other Construction Equipment	525	254.2000	Used for manitex, spacing carts, pullers, and tensioners
Other General Industrial Equipment	650	0.1724	
	300	264.9000	
Rubber-Tired Dozers	350	264.9000	Used for dozers
	120	51.7000	
	200	171.7000	
	300	344.9000	
	350	344.9000	
Tractors/Loaders/Backhoes	500	344.9000	Used for all backhoes, excavators, loaders & ditch diggers

Source: SCAQMD Air Quality Handbook, Off-Road Emissions Sources - (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

	HP (hp)	CO2 (lb/hr)	
Helicopters	650	1585.9440	Used for helicopters - No emission factor, estimated by assuming a 360 times factor of the CO emission factor.

Source: EPA 420-R-92-009 - Procedures for Emission Inventory Preparation, Volume IV, Mobile Sources, December 1992 - (http://www.ntl.bts.gov/docs/AQP.html - Table 5-7, Pg. 185)

On-Road Vehicles

	HP (hp)	CO2 (lb/hr)	
Crew & Foreman Trucks (Suburbans) (pounds/mile x 30 miles/hour)	Composite	32.985968	Used 'passenger vehicle' emfac
Pick-Up Trucks (pounds/mile) x 30 miles/hour	Composite	81.58302	Used 'delivery trucks' emfac
Heavy Duty Trucks and Truck-Mounted Equipment (pounds/mile) x 30 miles/hour	Composite	126.32014	Used 'heavy-heavy-duty trucks' emfac

Source: SCAQMD Air Quality Handbook, Emfac2007 (Ver2.3) Emission Factors (On-Road), Scenario Year 2008 - http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

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Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Subtransmission Lines					
Survey					
1 ½-Ton Pick-Up Truck 4X4	200	3	10	815.8	1.2
Total Survey				**815.8**	**1.2**
Roads					
2 1-Ton Crew Cab 4X4	300	10	2	131.9	0.7
1 Road Grader	350	10	10	2295.0	11.5
2 Track-Type Dozer	350	10	2.5	1324.5	6.6
1 Water Truck	350	10	10	1263.2	6.3
Total Roads				**5014.6**	**25.1**
Pole Framing and Setting					
2 ¾-Ton Suburban	300	147	10	659.7	48.5
2 5-Ton Framing Truck 4X4	350	83	10	2526.4	104.8
2 30-Ton line Truck	350	83	10	2526.4	104.8
1 Digger Truck	500	24	10	1263.2	15.2
1 Water Truck	350	83	10	1263.2	52.4
2 Backhoe	350	147	10	6898.0	507.0
2 Bucket Truck	350	147	10	2601.0	191.2
2 Truck-Mounted Crane	350	147	10	2526.4	185.7
1 30-Ton Crane	500	14	10	1801.0	12.6
1 Cement Truck	350	3	10	1263.2	1.9
Total Pole Framing and Setting				**23328.5**	**1224.1**

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Material Delivery						
2	60-Foot Flat-Bed Pole Truck	350	5	8	2021.1	5.1
1	Forklift	200	5	8	616.8	1.5
Total Material Delivery					**2637.9**	**6.6**
Conductor Installation						
1	Flat-Bed Truck & Trailer (Wire Puller)	300	24	6	757.9	9.1
1	Flat-Bed Truck & Trailer (Wire Dolly)	300	24	6	757.9	9.1
2	30-Ton line Truck	300	24	5	1263.2	15.2
2	¾-Ton Suburban	300	14	10	659.7	4.6
1	Water Truck	350	24	10	1263.2	15.2
2	Bucket Truck	350	24	6	1515.8	18.2
2	Truck-Mounted Crane	350	24	6	1515.8	18.2
Total Conductor Installation					**7733.6**	**89.5**
Restoration						
2	1-Ton Crew Cab 4X4	300	40	8	527.8	10.6
1	Water Truck	350	40	8	1010.6	20.2
Total Restoration					**1538.3**	**30.8**
Total Emissions from Subtransmission Line Construction						**1377.3**
Mirage Substation						
Civil						
1	Driller	Composite	50	8	1319.2	33.0
2	Crew Truck	Composite	80	2	131.9	5.3
1	14-Ton Crane	Composite	25	4	514.8	6.4
1	Dump Truck	Composite	75	6	757.9	28.4
1	Tractor	Composite	75	6	400.8	15.0

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
1	5-Ton Truck	Composite	15	4	505.3	3.8
1	Forklift	Composite	75	4	217.6	8.2
1	Ditch Digger	Composite	55	6	717.6	19.7
Total Civil					**4565.1**	**119.8**
Electrical						
2	Manlift	Composite	100	6	416.4	20.8
1	Pick-Up Truck	Composite	110	2	163.2	9.0
1	14-Ton Crane Truck	Composite	90	6	757.9	34.1
2	Crew Truck	Composite	110	2	131.9	7.3
1	150-Ton Crane	Composite	60	6	772.2	23.2
1	5-Ton Truck	Composite	50	2	252.6	6.3
1	Forklift	Composite	100	6	326.4	16.3
2	Carryall Vehicle	Composite	110	2	505.3	27.8
1	Support Truck	Composite	25	2	252.6	3.2
Total Electrical					**3578.6**	**147.9**
Transformer Installation						
2	Carryall Vehicle	Composite	22	6	1515.8	16.7
1	Manlift	Composite	20	6	208.2	2.1
1	Forklift	Composite	22	6	326.4	3.6
1	50-Ton Crane	Composite	15	6	772.2	5.8
2	Crew Truck	Composite	22	2	131.9	1.5
Total Transformer Installation					**2954.6**	**29.6**
Maintenance						
1	Foreman Truck	Composite	40	2	66.0	1.3
1	Manlift	Composite	40	6	208.2	4.2
2	Crew Truck	Composite	110	2	131.9	7.3
Total Maintenance					**406.1**	**12.7**

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Test					
1 Pick-Up Truck	Composite	110	2	163.2	9.0
Total Test				**163.2**	**9.0**
Total Mirage Substation					**319.04**
Concho Substation					
Electrical					
1 Carryall Vehicle	Composite	34	2	252.6	4.3
Test					
1 Pick-Up Truck	Composite	34	2	163.2	2.8
Total Concho Substation					**7.07**
Indian Wells Substation					
Electrical					
1 Carryall Vehicle	Composite	50	2	252.6	6.3
Test					
1 Pick-Up Truck	Composite	50	2	163.2	4.1
Total Indian Wells Substation					**10.4**
Santa Rosa Substation					
Electrical					
1 Carryall Vehicle	Composite	40	2	252.6	5.1

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Test					
1 Pick-Up Truck	Composite	40	2	163.2	3.3
Total Santa Rosa Substation					**8.3**
Devers Substation					
Civil					
1 Driller	Composite	2	8	1319.2	1.3
1 Crew Truck	Composite	5	2	66.0	0.2
1 Dump Truck	Composite	5	6	757.9	1.9
1 Tractor	Composite	5	6	400.8	1.0
Total Civil				**2543.9**	**4.4**
Electrical					
1 Manlift	Composite	45	6	208.2	4.7
1 Pick-Up Truck	Composite	60	2	163.2	4.9
1 Crew Truck	Composite	60	2	66.0	2.0
1 150-Ton Crane	Composite	10	6	772.2	3.9
1 Forklift	Composite	40	6	326.4	6.5
1 Carryall Vehicle	Composite	60	2	252.6	7.6
Total Electrical				**1788.6**	**29.5**
Maintenance					
1 Foreman Truck	Composite	5	2	66.0	0.2
1 Crew Truck	Composite	10	2	66.0	0.3
Total Maintenance				**131.9**	**0.5**

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Test					
1 Pick-Up Truck	Composite	20	2	163.2	1.6
Total Test				**163.2**	**1.6**
Total Devers Substation					**36.0**
Eisenhower Substation					
Civil					
1 Driller	Composite	5	8	1319.2	3.3
1 Crew Truck	Composite	15	2	66.0	0.5
1 Dump Truck	Composite	15	6	757.9	5.7
1 Tractor	Composite	15	6	400.8	3.0
1 Ditch Digger	Composite	5	6	717.6	1.8
Total Civil				**3261.5**	**14.3**
Electrical					
1 Manlift	Composite	35	6	208.2	3.6
1 Crew Truck	Composite	45	2	66.0	1.5
1 150-Ton Crane	Composite	20	6	772.2	7.7
1 Forklift	Composite	45	6	326.4	7.3
1 Carryall Vehicle	Composite	45	2	252.6	5.7
Total Electrical				**1625.4**	**25.9**
Maintenance					
1 Foreman Truck	Composite	5	2	66.0	0.2
1 Crew Truck	Composite	10	2	66.0	0.3
Total Maintenance				**131.9**	**0.5**

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Test					
1 Pick-Up Truck	Composite	45	2	163.2	3.7
Total Test				**163.2**	**3.7**
Total Eisenhower Substation					**44.3**
Farrell Substation					
Civil					
1 Driller	Composite	10	8	1319.2	6.6
1 Crew Truck	Composite	20	2	66.0	0.7
1 Dump Truck	Composite	20	6	757.9	7.6
1 Tractor	Composite	20	6	400.8	4.0
1 Ditch Digger	Composite	10	6	717.6	3.6
Total Civil				**3261.5**	**22.4**
Electrical					
1 Manlift	Composite	40	6	208.2	4.2
1 Crew Truck	Composite	55	2	66.0	1.8
1 150-Ton Crane	Composite	25	6	772.2	9.7
1 Forklift	Composite	55	6	326.4	9.0
1 Carryall Vehicle	Composite	55	2	252.6	6.9
Total Electrical				**1625.4**	**31.6**
Maintenance					
1 Foreman Truck	Composite	5	2	66.0	0.2
1 Crew Truck	Composite	10	2	66.0	0.3
Total Maintenance				**131.9**	**0.5**

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Test					
1 Pick-Up Truck	Composite	55	2	163.2	4.5
Total Test				**163.2**	**4.5**
Total Farrell Substation					**59.0**
Garnet Substation					
Electrical					
1 Carryall Vehicle	Composite	16	2	252.6	2.0
Test					
1 Pick-Up Truck	Composite	16	2	163.2	1.3
Total Garnet Substation					**3.3**
Thornhill Substation					
Electrical					
1 Carryall Vehicle	Composite	40	2	252.6	5.1
Test					
1 Pick-Up Truck	Composite	40	2	163.2	3.3
Total Thornhill Substation					**8.3**
Tamarisk Substation					
Civil					
1 Crew Truck	Composite	5	2	66.0	0.2
1 Dump Truck	Composite	5	6	757.9	1.9
1 Tractor	Composite	5	6	400.8	1.0
Total Civil				**1224.7**	**3.1**

Table F-23. Equipment Exhaust During Subtransmission Line Construction – CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Electrical					
1 Manlift	Composite	5	6	208.2	0.5
1 Pick-Up Truck	Composite	40	2	163.2	3.3
1 Crew Truck	Composite	40	2	66.0	1.3
1 150-Ton Crane	Composite	2	6	772.2	0.8
1 Forklift	Composite	5	6	326.4	0.8
1 Carryall Vehicle	Composite	40	2	252.6	5.1
Total Electrical				**1788.6**	**11.7**
Maintenance					
1 Foreman Truck	Composite	1	2	66.0	0.0
2 Crew Truck	Composite	2	2	131.9	0.1
Total Maintenance				**197.9**	**0.2**
Test					
1 Pick-Up Truck	Composite	30	2	163.2	2.4
Total Test				**163.2**	**2.4**
Total Tamarisk Substation					**17.4**

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Table F-24. Subtransmission Line Emission Factors

Off-Road Construction Equipment	Emission Factors		Notes:
	HP	CO2	
	(hp)	(lb/hr)	
Aerial Lifts	Composite	34.7000	Used for manlifts
Bore/Drill Rigs	Composite	164.9000	Used for drillers and sleeve rigs
	500	180.1000	
Cranes	Composite	128.7000	Used for all cranes
Excavators	Composite	119.6000	Used for excavators and ditch diggers
	200	77.1000	
Forklifts	Composite	54.4000	Used for forklifts
Graders	350	229.5000	Used for graders
Off-Highway Trucks	Composite	260.1000	Used for all diesel trucks & carryall vehicles
Other Material Handling Equipment	Composite	141.2000	Used for cable puller & conductor tensioner
Other Construction Equipment	Composite	122.8000	Used for cable dollies
Rubber-Tired Dozers	350	264.9000	Used for dozers
	350	344.9000	
Tractors/Loaders/Backhoes	Composite	66.8000	Used for all backhoes & ditch diggers

Source: SCAQMD Air Quality Handbook, Off-Road Emissions Sources - (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

On-Road Vehicles	HP	CO2	
	(hp)	(lb/hr)	
Crew & Foreman Trucks (Suburbans) (pounds/mile x 30 miles/hour)	Composite	32.985968	Used 'passenger vehicle' emfac
Pick-Up Trucks (pounds/mile) x 30 miles/hour	Composite	81.58302	Used 'delivery trucks' emfac
Heavy Duty Trucks and Truck-Mounted Equipment (pounds/mile) x 30 miles/hour	Composite	126.3201435	Used 'heavy-heavy-duty trucks' emfac

Source: SCAQMD Air Quality Handbook, Emfac2007 (Ver2.3) Emission Factors (On-Road), Scenario Year 2008 - http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

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Table F-25. Equipment Exhaust During Telecommunication Construction - CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Mirage-Santa Rosa						
	Cable Construction					
2	Bucket Truck	Composite	5	8	2021.1	5.1
1	Pick-Up	Composite	5	8	652.7	1.6
1	2-Axle Trailer	Composite	5	8	1129.6	2.8
	Total Cable Construction				**3803.4**	**9.5**
	Receive and Loadout					
1	5-Ton Forklift	Composite	1	8	435.2	0.2
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Receive and Loadout				**1087.9**	**0.5**
	Clean-Up					
2	Bucket Truck	Composite	1	8	2021.1	1.0
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Clean-Up				**2673.8**	**1.3**
	Total Mirage Santa Rosa					**11.39**
Farrell-Garnet						
	Cable Construction					
2	Bucket Truck	Composite	18	8	2021.1	18.2
1	Pick-Up	Composite	18	8	652.7	5.9
1	2-Axle Trailer	Composite	18	8	1129.6	10.2
	Total Cable Construction				**3803.4**	**34.2**
	Receive and Loadout					
1	5-Ton Forklift	Composite	1	8	435.2	0.2
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Receive and Loadout				**1087.9**	**0.5**
	Clean-Up					
2	Bucket Truck	Composite	1	8	2021.1	1.0
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Clean-Up				**2673.8**	**1.3**
	Total Farrel Garnet					**36.11**
Devers						
	Equipment Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Cable Construction				**1305.3**	**3.9**
	Circuit Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Circuit Installation				**1305.3**	**3.9**

Table F-25. Equipment Exhaust During Telecommunication Construction - CO2 Exhaust Emissions

	Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
	Clean-Up					
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Clean-Up				**652.7**	**0.3**
	Total Devers					**8.16**
	Mirage					
	Equipment Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Cable Construction				**1305.3**	**3.9**
	Circuit Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Circuit Installation				**1305.3**	**3.9**
	Clean-Up					
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Clean-Up				**652.7**	**0.3**
	Total Mirage					**8.16**
	Tamarisk					
	Equipment Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Cable Construction				**1305.3**	**3.9**
	Circuit Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Circuit Installation				**1305.3**	**3.9**
	Clean-Up					
1	Pick-Up	Composite	1	8	652.7	0.3
	Total Clean-Up				**652.7**	**0.3**
	Total Tamarisk					**8.16**
	Eisenhower					
	Equipment Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Cable Construction				**1305.3**	**3.9**
	Circuit Installation					
2	Pick-Up	Composite	6	8	1305.3	3.9
	Total Circuit Installation				**1305.3**	**3.9**
	Clean-Up					
1	Pick-Up	Composite	1	8	652.7	0.3

Table F-25. Equipment Exhaust During Telecommunication Construction - CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Total Clean-Up				**652.7**	**0.3**
Total Eisenhower					**8.16**
Concho					
Equipment Installation					
2 Pick-Up	Composite	6	8	1305.3	3.9
Total Cable Construction				**1305.3**	**3.9**
Circuit Installation					
2 Pick-Up	Composite	6	8	1305.3	3.9
Total Circuit Installation				**1305.3**	**3.9**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Concho					**8.16**
Indian Wells					
Equipment Installation					
2 Pick-Up	Composite	6	8	1305.3	3.9
Total Cable Construction				**1305.3**	**3.9**
Circuit Installation					
2 Pick-Up	Composite	6	8	1305.3	3.9
Total Circuit Installation				**1305.3**	**3.9**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Indian Wells					**8.16**
Santa Rosa					
Equipment Installation					
2 Pick-Up	Composite	6	8	1305.3	3.9
Total Cable Construction				**1305.3**	**3.9**
Circuit Installation					
2 Pick-Up	Composite	6	8	1305.3	3.9
Total Circuit Installation				**1305.3**	**3.9**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Santa Rosa					**8.16**

Table F-25. Equipment Exhaust During Telecommunication Construction - CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
Thornhill					
Equipment Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Cable Construction				**652.7**	**2.0**
Circuit Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Circuit Installation				**652.7**	**2.0**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Thornhill					**4.24**
Garnet					
Equipment Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Cable Construction				**652.7**	**2.0**
Circuit Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Circuit Installation				**652.7**	**2.0**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Garnet					**4.24**
Farrell					
Equipment Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Cable Construction				**652.7**	**2.0**
Circuit Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Circuit Installation				**652.7**	**2.0**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Farrell					**4.24**

Table F-25. Equipment Exhaust During Telecommunication Construction - CO2 Exhaust Emissions

Construction	HP	Duration (days)	Usage (hour/day)	CO2 Emissions (lb/day)	CO2 Emissions (tons/project)
EDOM Hill					
Equipment Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Cable Construction				**652.7**	**2.0**
Circuit Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Circuit Installation				**652.7**	**2.0**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total EDOM Hills					**4.24**
Palm Springs					
Equipment Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Cable Construction				**652.7**	**2.0**
Circuit Installation					
1 Pick-Up	Composite	6	8	652.7	2.0
Total Circuit Installation				**652.7**	**2.0**
Clean-Up					
1 Pick-Up	Composite	1	8	652.7	0.3
Total Clean-Up				**652.7**	**0.3**
Total Palm Springs					**4.24**
TOTAL EMISSIONS DURING CONSTRUCTION					**125.8**

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Table F-26. Telecommunication Equipment Emission Factors

Off-Road Construction Equipment	Emission Factors		Notes:
	HP (hp)	CO2 (lb/hr)	
Forklifts	Composite	54.4000	Used for forklifts
Off-Highway Trucks	Composite	260.1000	Used for all diesel trucks & carryall vehicles
Other Material Handling Equipment	Composite	141.2000	Used for cable puller & conductor tensioner

Source: SCAQMD Air Quality Handbook, Off-Road Emissions Sources - (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

On-Road Vehicles	HP (hp)	CO2 (lb/hr)	
Crew & Foreman Trucks (Suburbans) (pounds/mile x 30 miles/hour)	Composite	32.985968	Used 'passenger vehicle' emfac
Pickup Trucks (pounds/mile) x 30 miles/hour	Composite	81.58302	Used 'delivery trucks' emfac
Heavy Duty Trucks and Truck-Mounted Equipment (pounds/mile) x 30 miles/hour	Composite	126.3201435	Used 'heavy-heavy-duty trucks' emfac

Source: SCAQMD Air Quality Handbook, Emfac2007 (Ver2.3) Emission Factors (On-Road), Scenario Year 2008 - http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html

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Notes
Devers-Mirage 115 kV Construction

AQ Calculations by: Eric Rivero-Montes
Last Calculation Date: 11/20/2007
Project Description: As provided in PEA
Equipment List Provided by: As provided in PEA
Date Provided:

Schedule Provided by:
Date Provided

Construction Element	Number of Personnel	Number of Days	Start Date	Finish Date	Equipment Requirements		HP	Hrs/Day	Notes
					Number	Description			
Roads	3								
		10			2	Crew Truck (gasoline)	200	2	ALW assumed HP
		10			2	Light Truck	180	2	ALW assumed HP
		10			1	Crawler D6	250	10	ALW assumed HP
		10			1	Crawler D8	250	10	ALW assumed HP
		10			1	Motor Grader	250	5	ALW assumed HP
		10			1	Water Truck	250	2	ALW assumed HP
Subtransmission Line	30	171			2	Crew Truck (gasoline)	200	10	ALW assumed HP
		107			2	Line Truck	250	10	ALW assumed HP
		107			2	Light Truck	180	10	ALW assumed HP
		171			2	Bucket Truck	250	10	ALW assumed HP
		107			2	Truck-Mounted Crane	250	10	ALW assumed HP
		24			1	Conductor-Pulling Machine	300	10	ALW assumed HP
		24			1	Tensioner (gasoline)	300	10	ALW assumed HP

Construction Element	Number of Personnel	Number of Days	Start Date	Finish Date	Equipment Requirements		HP	Hrs/Day	Notes
		14			1	30-Ton Crane	250	10	ALW assumed HP
		171			2	Backhoe	250	10	ALW assumed HP
		24			1	Drilling Rig	500	10	ALW assumed HP
		107			1	Water Truck	250	10	ALW assumed HP
		3			1	Concrete Truck	500	10	ALW assumed truck needed
		0			0	Flat-Bed Pole Truck	500	10	ALW assumed truck needed
Staging areas		0			0	Crane (diesel)	250	10	ALW assumed equipment needed
Staging areas		0			0	980 Loader (diesel)	250	10	ALW assumed equipment needed
Staging areas		0			0	Forklift (diesel)	250	10	ALW assumed equipment needed
Telecommunications									
Equipment Construction	2	13			2	Van (gasoline)	200	7	ALW assumed HP
Overhead Construction	4	50			1	Bucket Truck	250	8	ALW assumed HP
		50			1	Reel Truck	250	8	ALW assumed HP
Underground Conduit	3	5			1	Flat-Bed Truck	250	1	ALW assumed HP
		5			1	Backhoe	250	8	ALW assumed HP
		5			1	Stake-Bed Truck	250	2	ALW assumed HP
		5			1	Crew Truck (gasoline)	200	2	ALW assumed HP
	4	2			1	Bucket Truck	250	2	ALW assumed HP
		2			1	Reel Truck	250	2	ALW assumed HP