

APPENDIX P: REVISED AIR QUALITY AND GHG CALCULATIONS

INTRODUCTION

This appendix documents the revisions that have been made to the air quality and greenhouse gas (GHG) analysis to incorporate the technical design modification and additional engineering refinements that have been made to the Alberhill System Project (Proposed Project or ASP) since the time of the original ASP (i.e., the project design documented in the Final Environmental Impact Report [FEIR] published in 2017 or Original Project). Appendix M: Revised Project Description provides a detailed description of the changes to the Proposed Project.

This revised air quality and GHG analysis takes the conventional construction method calculations from Appendix B of the FEIR and modifies them to include the:

- Site development changes associated with converting the 500 kV switchrack at the proposed Alberhill Substation from a gas-insulated switchgear design to air-insulated switchgear design;
- More defined use of conventional construction methods for the installation of nine new 500 kV towers;
- More defined use of helicopter construction methods for the installation of three new 500 kV towers;
- Installation of underground 115 kV components along Segments ASP2 and ASP8;
- Addition of substation modifications at Southern California Edison's existing Valley, Newcomb, Skylark, Ivyglen, Fogarty, and Tenaja Substations; and
- Construction sequence changes.

Additional minor modifications to the assumptions have been made to accommodate refinements to the Proposed Project design and the on- and off-road equipment emission factors have been revised to account for construction starting in 2025.

Revisions to the air quality and GHG calculations have been noted as follows:

- Changes to the modeling inputs have been noted in a purple fill with a purple dashed outline
- New modeling inputs/tables have been noted in an orange fill with an orange dashed outline

Due to the changes to the emission factors and other modeling inputs, changes to the resulting outputs have not been marked in the resulting model output. The anticipated emissions from the following four scenarios have been presented:

- Soil Import Option 1 without Project Commitment J,
- Soil Import Option 1 with Project Commitment J,
- Soil Import Option 2 without Project Commitment J, and
- Soil Import Option 2 with Project Commitment J.

SOIL IMPORT OPTION 1 WITHOUT PROJECT COMMITMENT J

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Construction Emissions

The following emissions were calculated for construction activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:
 - a. Daily emissions were calculated for each construction phase for each Proposed Project Component.

These calculations are in Table 7 through Table 50.

Total daily emissions, including both on-site and off-site sources, are summarized by construction phase in Table 1.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

PM10 and PM2.5 emission factors for earth moving and soil handling were calculated from AP-42 sections and from the SCAQMD CEQA Handbook.

These emission factors are in Table 57.
 - b. The construction phases for each Proposed Project component that could overlap were identified, and daily emissions from overlapping phases were added together. The highest emissions that could occur on a single day during construction of each Proposed Project component were then identified. These emissions are summarized in Table 2.
 - c. Since construction of all of the Proposed Project components could occur at the same time, the maximum daily emissions during construction of the components were added together to estimate peak daily construction emissions. However, since substation site demolition and water line relocation activities would be completed prior to the start of any other construction, they were not included in the peak daily emissions calculation. The peak daily construction emissions are in Table 2.
2. Maximum daily on-site emissions during construction of each Proposed Project component for use in a Localized Significance Threshold (LST) analysis using the look-up table in Appendix C to the SCAQMD's Localized Significance Methodology. The following steps were used to calculate these emissions and to conduct the LST analysis.
 - a. Daily on-site emissions were calculated for each construction phase for each Proposed Project Component. On-site emissions for substation construction were defined as emissions that would occur on the substation site. On-site emissions for 500 kV transmission line and 115 kV subtransmission line construction were defined as emissions that would occur at a single 500 kV lattice tower or a 115 kV pole

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location.

These calculations are in Table 9 through Table 50.

On-site daily emissions by construction phase are summarized in Table 3.

The same emission factors used to calculate total daily emission were used to calculate on-site daily emissions.

- b. Since multiple construction phases could occur at the same time at the substation site, daily on-site emissions from overlapping phases were added together to identify maximum on-site daily emissions during substation construction. Maximum daily on-site emissions during telecommunications construction were added to the maximum daily emissions during substation construction, since telecommunications construction will occur at the substation site. Maximum daily on-site emissions Table 4.
- c. Since only one construction phase could occur at a 500 kV transmission line tower location or 115 kV subtransmission line pole location, emissions from overlapping phases were not added together to calculate maximum daily on-site emissions. Maximum daily on-site emissions during 500 kV transmission line and 115 kV subtransmission line construction are in Table 4.
- d. Distances to the closest receptors were determined for the LST analysis. For the substation site, the distance to the closest commercial receptor was used for analyses for CO and NO₂, since the air quality thresholds are for short-term averaging periods. The distance to the closest residential receptor was used for the PM₁₀ and PM_{2.5} analyses, since the air quality thresholds are for 24-hour averaging periods, and an individual would probably not be located at a commercial location for 24 hours.
The closest receptor to a 500 kV transmission tower location is a residence.
A distance of 25 meters was assumed for the receptor distance for the analysis for 115 kV subtransmission line construction.
- e. The look-up table values for the Lake Elsinore source/receptor area were used for the LST analyses.
- f. The maximum construction area in the look-up tables of 5 acres was used for the LST analysis for the substation site, and the minimum area of 1 acre was used for the 500 kV transmission line tower and 115 kV subtransmission line pole analyses.
- g. The maximum allowable daily on-site emissions for the analyses for the substation and 500 kV transmission line towers were calculated using linear interpolation with receptor distance of the emissions in the look-up tables to calculate allowable emissions for the actual receptor distances. Interpolation was not used for the LST analyses for the 115 kV subtransmission line analyses, since the receptor distance was assumed to be 25 meters. The LST analyses are in Table 5.

3. Total greenhouse gas (GHG) emissions during construction. The following steps were used to calculate these emissions:

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- a. Total GHG emissions were calculated for each construction phase for Each Proposed Project Component. These calculations are in Table 9 through Table 50. Total GHG emissions, including both on-site and off-site sources, are summarized by construction phase in Table 6.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

- b. Total GHG emissions during each construction phase were added together to calculate total GHG emissions during construction. These emissions are summarized in Table 6.

Operational Emissions

The following emissions were calculated for operational activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:

- a. Daily emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

- b. It was conservatively assumed that the transmission line inspections would both occur on the same day as a visit to the substation site, and daily emissions from these three activities were added together to peak daily operational emissions. These emissions are in Table 52.

2. Annual greenhouse gas (GHG) emissions during operation. The following steps were used to calculate these emissions:

- a. Annual emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

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The exhaust emission factors are in Table 53 through Table 55.

- b. Annual emissions from leakage of sulfur hexafluoride (SF6) from gas-insulated switch gear (GIS) were calculated by multiplying the total amount of SF6 in new GIS by the estimated annual leakage rate. The annual SF6 leakage rate was then multiplied by the SF6 global warming potential to calculate annual CO2-equivalent emissions from SF6 leakage. These calculations are in Table 52.
- c. Annual GHG emissions from the operational activities and from SF6 leakage were added together to calculate Annual operational GHG emissions. These emissions are summarized in Table 52.

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	3.42	23.90	30.16	0.12	25.15	3.40
Substation Site Water Line Relocation	0.65	6.60	2.80	0.01	39.81	4.08
Substation Construction						
Survey	0.11	0.86	0.07	0.00	12.58	1.25
Grading	8.99	55.86	53.28	0.21	281.43	33.56
Fencing	0.42	4.32	1.30	0.01	35.20	3.52
Civil	2.90	31.01	20.07	0.10	49.97	5.53
Control Building	0.17	1.32	0.20	0.00	32.50	3.24
Electrical	1.26	12.43	6.41	0.03	38.15	4.00
Wiring	0.28	2.25	0.63	0.01	25.18	2.52
Transformers	0.66	6.27	2.25	0.01	46.81	4.74
Maintenance Crew Equipment Check	0.12	0.94	0.19	0.00	34.00	3.40
Testing	0.11	0.87	0.07	0.00	18.77	1.87
Asphalting	2.41	11.86	12.23	0.05	51.66	5.51
Landscaping	1.72	11.07	15.40	0.07	43.25	4.68
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	20.45	2.04
Marshalling Yard	0.63	4.65	2.81	0.02	31.55	3.22
Roads and Landing Work	2.37	19.00	10.34	0.05	54.71	6.83
Install Helicopter Platforms	0.16	1.23	0.10	0.00	0.32	0.02
Tower Removal	1.02	6.57	4.56	0.02	105.34	10.67
Foundation Removal	0.61	6.89	2.73	0.01	49.41	5.03
Tower Foundations Installation	2.01	15.93	6.66	0.06	107.57	10.97
Install Micropile Foundations	0.16	1.23	0.10	0.00	0.32	0.02
Tower Steel Haul	0.31	3.62	0.90	0.01	55.51	5.57
Tower Steel Assembly	0.98	8.03	3.96	0.02	33.29	3.44
Tower Erection	1.46	8.84	6.22	0.03	83.50	8.52
Tower Erection (Helicopter) Ground Support	0.82	6.98	2.35	0.02	94.04	9.44
Tower Helicopter Operations	46.71	56.80	577.42	32.18	12.02	12.02
Wire Stringing	20.27	61.08	38.52	1.51	383.75	39.37
Restoration	1.08	8.31	4.75	0.03	47.70	5.20
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard	0.36	3.35	1.16	0.01	23.35	2.36
Roads and Landing Work	1.79	14.07	8.05	0.04	6.40	1.31
Guard Structure Installation	1.61	10.08	7.33	0.05	0.69	0.27
Remove Existing Wood H-Frames and Poles	1.07	7.58	4.97	0.02	0.60	0.20
Remove Existing Tubular Steel/Light Weight Steel Poles	0.98	5.99	4.23	0.02	0.69	0.18
Install Tubular Steel Pole Foundations	1.41	11.32	5.50	0.05	2.83	0.44
Steel Pole Haul	0.70	3.43	3.10	0.02	0.41	0.12
Steel Pole Assembly	0.98	5.99	4.23	0.02	0.69	0.18
Steel Pole Erection	0.98	5.99	4.23	0.02	0.69	0.18
Wire Stringing	5.07	29.37	24.43	0.15	2.08	0.80
Vault Installation	2.63	17.58	10.62	0.07	2.43	0.60
Duct Bank Installation	1.39	13.75	6.11	0.04	2.84	0.59
Install Underground Cable	3.51	19.09	13.63	0.09	1.50	0.50
Guard Structure Removal	1.50	9.66	7.71	0.04	0.69	0.29
Restoration	1.22	9.85	5.55	0.03	7.12	0.88
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation	0.27	2.81	1.45	0.01	0.30	0.07
Control Building	0.54	3.56	3.15	0.02	0.23	0.09
Overhead Communications Installation	0.60	3.97	3.18	0.02	0.33	0.10
Substation Telecommunications Equipment Installation	0.08	0.62	0.05	0.00	0.16	0.01
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	35.67	3.60
Additional Substation Construction						

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	1.16	12.41	6.30	0.03	11.38	1.32
Electrical	1.41	13.32	7.68	0.03	0.84	0.31
Wiring	0.44	3.97	1.56	0.01	0.59	0.09
Testing	0.11	0.83	0.07	0.00	0.22	0.02
Civil - Demo	0.58	5.75	3.19	0.02	11.35	1.22

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	21.85	2.51
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	39.43	4.05
Substation Construction						
Survey	0.00	0.03	0.00	0.00	12.37	1.24
Grading	7.77	48.63	41.91	0.15	279.35	33.09
Fencing	0.16	2.27	1.13	0.00	34.66	3.48
Civil	1.69	23.53	10.30	0.04	48.67	5.11
Control Building	0.01	0.09	0.09	0.00	32.18	3.22
Electrical	0.87	9.35	6.16	0.02	37.35	3.94
Wiring	0.08	0.61	0.49	0.00	24.75	2.49
Transformers	0.40	4.21	2.08	0.01	46.27	4.70
Maintenance Crew Equipment Check	0.02	0.12	0.12	0.00	33.79	3.38
Testing	0.01	0.05	0.00	0.00	18.55	1.86
Asphalting	1.52	6.44	4.79	0.01	50.12	5.19
Landscaping	0.30	2.81	1.80	0.00	40.86	4.12
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	31.20	3.18
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	23.13	2.35
Roads and Landing Work	1.60	12.73	7.50	0.04	6.06	1.27
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	2.34	0.37
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	1.09	0.43
Duct Bank Installation	0.71	8.86	3.54	0.02	1.53	0.43
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	6.64	0.83
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	35.45	3.58
Additional Substation Construction						

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	10.89	1.20
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	10.92	1.15

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	21.85	2.51
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	39.43	4.05
Substation and Telecommunications Construction						
Survey	0.00	0.03	0.00	0.00	12.37	1.24
Grading	7.77	48.63	41.91	0.15	279.35	33.09
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	3.05	23.14	14.86	0.04	277.65	28.26
Civil	1.69	23.53	10.30	0.04	48.67	5.11
Landscaping	0.30	2.81	1.80	0.00	40.86	4.12
Maximum Substation Construction	7.77	48.63	41.91	0.15	279.35	33.09
Maxim Substation plus Telecommunications	8.60	55.37	46.29	0.17	314.81	36.67
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	31.20	3.18
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
Maximum	5.93	32.28	29.00	0.15	31.20	3.18
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	23.13	2.35
Roads and Landing Work	1.60	12.73	7.50	0.04	6.06	1.27
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	2.34	0.37
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	1.09	0.43
Duct Bank Installation	0.71	8.86	3.54	0.02	1.53	0.43
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	6.64	0.83
Maximum	4.34	23.98	22.32	0.13	23.13	2.35
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	35.45	3.58
Maximum	0.83	6.74	4.38	0.02	35.45	3.58
Additional Substation Construction						

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	10.89	1.20
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	10.92	1.15
Maximum	1.15	11.27	7.51	0.02	10.92	1.20

^a The construction phases within a group could all occur at the same time at the same location.

The following 115 kV Subtransmission Line construction activity emissions were divided by the following number of locations:

- Roads and Landing Work: 6 structure pads per day
- Guard Structure Installation: 4 structures per day
- Remove Existing H-Frames and Poles: 15 poles per day
- Remove Existing Tubular Steel/Light Weight Steel Poles: 2 poles per day
- Steel Pole Assembly: 2 poles per day
- Steel Pole Erection: 2 poles per day
- Guard Structure Removal: 6 structures per day
- Restoration: 6 structure pads per day

Table 5
Construction Emissions
Localized Significance Threshold Analysis

Pollutant	Maximum Daily Onsite Emissions	Receptor Distance (m)	Allowable Emissions Interpolation ^a				Interpolated Emissions (lb/day) ^b	Allowable Exceeded?
			Distance 1 (m)	Emissions 1 (lb/day)	Distance 2 (m)	Emissions 2 (lb/day)		
Demolition^{c,d}								
CO	13	270	200	7,535	500	25,792	11,795	No
NOx	8	270	200	672	500	1,072	765	No
PM10	22	420	200	96	500	207	177	No
PM2.5	3	420	200	31	500	105	85	No
Water Line Relocation^{c,e}								
CO	5	270	200	4,850	500	21,040	8,628	No
NOx	3	270	200	460	500	896	562	No
PM10	39	420	200	67	500	178	148	No
PM2.5	4	420	200	20	500	86	68	No
Substation and Telecommunications Construction^c								
CO	55	270	200	7,535	500	25,792	11,795	No
NOx	46	270	200	672	500	1,072	765	No
PM10	315	420	200	96	500	207	177	Yes
PM2.5	37	420	200	31	500	105	85	No
500 kV Transmission Line Construction^f								
CO	32	93	50	974	100	1,918	1,786	No
NOx	29	93	50	203	100	292	280	No
PM10	31	93	50	12	100	30	27	Yes
PM2.5	3	93	50	4	100	8	7	No
115 kV Subtransmission Line Construction^g								
CO	24	25	25	661	25	661	661	No
NOx	22	25	25	162	25	162	162	No
PM10	23	25	25	13	25	13	13	Yes
PM2.5	2	25	25	3	25	3	3	No

^a Allowable emissions are from Appendix C to Final Localized Significance Methodology, SCAQMD, revised July 2008, downloaded from <http://www.aqmd.gov/ceqa/handbook/LST/LST.html>

^b Interpolated emissions = Emissions 1 + (Receptor distance - Distance 1) x (Emissions 2 - Emissions 1) / (Distance 2 - Distance 1)

^c CO and NOx receptor distances are closest commercial receptor; PM10 and PM2.5 are closest residential receptor. Allowable emissions are for a 5 acre site.

^d Allowable emissions are for a 5 acre site.

^e Allowable emissions are for a 1 acre site.

^f Closest receptor to a transmission tower base is a residence at approximately 93 meters. Allowable emissions are for a 1 acre site.

^g Allowable emissions for CO, NOx and PM2.5 are for a 1-acre site to represent construction at a pole location.

Maximum PM10 emissions occur at the marshalling yard, so allowable emissions are for a 5-acre site

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO ₂ e (MT)
Substation Site Demolition	283.31
Substation Site Water Line Relocation	11.84
Substation Construction	
Survey	1.89
Grading	557.62
Fencing	7.31
Civil	375.00
Control Building	4.02
Electrical	346.90
Wiring	71.94
Transformers	57.20
Maintenance Crew Equipment Check	8.83
Testing	25.71
Asphalting	66.81
Landscaping	144.94
500 kV Transmission Line Construction	
Survey	0.52
Marshalling Yard	87.79
Roads and Landing Work	53.15
Install Helicopter Platforms	32.89
Tower Removal	4.03
Foundation Removal	1.46
Tower Foundations Installation	63.63
Install Micropile Foundations	122.15
Tower Steel Haul	3.76
Tower Steel Assembly	38.82
Tower Erection	32.96
Tower Erection (Helicopter) Ground Support	6.40
Tower Helicopter Operations	1,626.43
Wire Stringing	18.53
Restoration	4.27
115 kV Subtransmission Line Construction	
Survey	2.54
Marshalling Yard	145.31
Roads and Landing Work	128.76
Guard Structure Installation	52.96
Remove Existing Wood H-Frames and Poles	24.84
Remove Existing Tubular Steel/Light Weight Steel Poles	4.98
Install Tubular Steel Pole Foundations	159.88
Steel Pole Haul	95.64
Steel Pole Assembly	254.01
Steel Pole Erection	254.01
Wire Stringing	541.72
Vault Installation	15.31
Duct Bank Installation	17.61
Install Underground Cable	94.21
Guard Structure Removal	29.04
Restoration	22.66
Telecommunications Construction	
Tower Foundation	3.69

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO₂e (MT)
Tower Construction	29.76
Dish Installation	2.99
Control Building	21.81
Overhead Communications Installation	28.92
Substation Telecommunications Equipment Installation	0.91
Santiago Peak Communication Site	18.85
Additional Substation Construction	
Civil	11.89
Electrical	24.70
Wiring	12.80
Testing	2.43
Civil - Demo	6.67
Total	6,069.00

Table 7
Substation Site Demolition Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.39	12.69	7.61	0.02	0.39	0.36	47.9
Onsite Motor Vehicle Exhaust	0.01	0.04	0.09	0.00	0.00	0.00	1.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	21.45	2.14	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.39	12.73	7.70	0.02	21.85	2.51	48.9
Offsite Motor Vehicle Exhaust	2.03	11.17	22.45	0.10	1.19	0.89	234.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	2.11	0.00	
Offsite Total	2.03	11.17	22.45	0.10	3.30	0.89	234.4
Total	3.42	23.90	30.16	0.12	25.15	3.40	283.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Track Loader	148	2	50	8
Bobcat	75	1	50	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Track Loader	148	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Track Loader	1.32	11.62	7.11	0.02	0.39	0.35
Bobcat	0.07	1.07	0.50	0.00	0.01	0.01
Total	1.39	12.69	7.61	0.02	0.39	0.36

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Track Loader	44.0	0.0	44.0
Bobcat	3.9	0.0	3.9
Total	47.9	0.0	47.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	1	50	4	10
Offsite				
Dump Truck	40	50	N/A	60
Worker Commute	4	50	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 20,000 CY hauled offsite over 50 days and 10 CY/truck = 20,000 / 50 / 10 = 40

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 7
Substation Site Demolition Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.01	0.04	0.09	0.00	0.00	0.00
Offsite						
Dump Truck	1.92	10.35	22.38	0.10	1.16	0.87
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	2.03	11.17	22.45	0.10	1.19	0.89
Total	2.04	11.21	22.54	0.10	1.19	0.89

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	1.0	0.0	1.0
Onsite Total	1.0	0.0	1.0
Offsite			
Dump Truck	228.3	0.0	228.4
Worker Commute	6.0	0.0	6.1
Offsite Total	234.4	0.0	234.4
Total	235.3	0.0	235.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Onsite Total						21.45	2.14
Offsite							
Dump Truck	40	Paved	60	0.001	0.000	1.92	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						2.11	0.00
Total						23.56	2.14

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion ^d	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 8
Substation Site Water Line Relocation Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	5.08	2.56	0.01	0.10	0.10	7.4
Onsite Motor Vehicle Exhaust	0.01	0.09	0.12	0.00	0.01	0.01	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	39.18	3.92	
Earthwork Fugitive PM	--	--	--	--	0.15	0.03	
Onsite Total	0.47	5.16	2.68	0.01	39.43	4.05	7.6
Offsite Motor Vehicle Exhaust	0.18	1.44	0.12	0.00	0.04	0.03	4.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.18	1.44	0.12	0.00	0.38	0.03	4.2
Total	0.65	6.60	2.80	0.01	39.81	4.08	11.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	20	8
Crane	125	1	20	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.46	5.08	2.56	0.01	0.10	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	3.8	0.0	3.8
Crane	3.6	0.0	3.6
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	20	1	2.5
Stakebed Truck	2	20	2	5
Crew Vehicle	2	20	2	5
Offsite				
Worker Commute	7	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Stakebed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Highest (Most Conservative) EMFAC2007 (version 2.3) or Highest (Most Conservative) EMFAC2007 (version 2.3)

Table 8
Substation Site Water Line Relocation Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.00	0.01	0.02	0.00	0.00	0.00
Stakebed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.12	0.00	0.01	0.01
Offsite						
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.18	1.44	0.12	0.00	0.04	0.03
Total	0.20	1.53	0.24	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.2	0.0	0.2
Offsite			
Worker Commute	4.2	0.0	4.2
Offsite Total	4.2	0.0	4.2
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Stakebed Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Crew Vehicle	2	Unpaved	5	1.237	0.124	12.37	1.24
Onsite Total						39.18	3.92
Offsite							
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						39.51	3.92

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	147	9.94E-04	2.07E-04	0.15	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.15	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Based on trench 4 ft. wide x 6 ft. deep x 1,700 ft. long over 20 days x 2 = 4 ft. x 6 ft. x 1,770 ft. / 27 cu. ft. per CY / 20 days = 151 CY/day 7

**Table 9
Substation Construction Emissions
Survey**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.03	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	12.37	1.24	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.03	0.00	0.00	12.37	1.24	0.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	1.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	1.8
Total	0.11	0.86	0.07	0.00	12.58	1.25	1.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Vehicle	2	15	2	5
Offsite				
Worker Commute	4	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 9
Substation Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.03	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.86	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	1.8	0.0	1.8
Offsite Total	1.8	0.0	1.8
Total	1.9	0.0	1.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Vehicle	2	Unpaved	5	1.237	0.124	12.37	1.24
Onsite Total						12.37	1.24
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						12.56	1.24

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 10
Substation Construction Emissions
Grading

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	7.68	48.05	41.39	0.15	1.61	1.48	393.3
Onsite Motor Vehicle Exhaust	0.09	0.59	0.52	0.00	0.04	0.03	9.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	242.44	24.24	
Earthwork Fugitive PM	--	--	--	--	35.26	7.33	
Onsite Total	7.77	48.63	41.91	0.15	279.35	33.09	402.4
Offsite Motor Vehicle Exhaust	1.22	7.23	11.36	0.05	0.64	0.47	155.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.44	0.00	
Offsite Total	1.22	7.23	11.36	0.05	2.08	0.47	155.2
Total	8.99	55.86	53.28	0.21	281.43	33.56	557.6

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Dozer	305	2	60	7
Loader	147	3	60	4
Scraper	267	3	60	7
Grader	110	1	60	7
4x4 Backhoe	79	2	60	7
4x4 Tamper	174	1	60	7
Excavator	152	1	60	7

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Dozer	305	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Loader	147	0.055	0.620	0.259	0.001	0.013	0.012	106.315	0.005	Rubber Tired Loaders
Scraper	267	0.176	0.733	0.973	0.003	0.036	0.034	321.428	0.016	Scrapers
Grader	110	0.052	0.501	0.322	0.001	0.015	0.014	74.965	0.005	Graders
4x4 Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
4x4 Tamper	174	0.038	0.586	0.173	0.001	0.007	0.007	106.516	0.003	Other Construction Equipment
Excavator	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Dozer	1.95	8.23	10.54	0.04	0.39	0.36
Loader	0.66	7.44	3.11	0.01	0.16	0.14
Scraper	3.69	15.40	20.43	0.07	0.77	0.70
Grader	0.36	3.51	2.25	0.01	0.11	0.10
4x4 Backhoe	0.39	4.73	2.47	0.01	0.08	0.07
4x4 Tamper	0.27	4.10	1.21	0.01	0.05	0.05
Excavator	0.36	4.64	1.39	0.01	0.06	0.06
Total	7.68	48.05	41.39	0.15	1.61	1.48

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Dozer	98.8	0.0	98.9
Loader	34.7	0.0	34.8
Scraper	183.7	0.0	183.9
Grader	14.3	0.0	14.3
4x4 Backhoe	19.7	0.0	19.7
4x4 Tamper	20.3	0.0	20.3
Excavator	21.4	0.0	21.4
Total	392.9	0.0	393.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 10
Substation Construction Emissions
Grading

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	3	60	7	17.5
Crew Vehicle	6	60	7	17.5
Offsite				
Dump Truck	20	60	N/A	60
Worker Commute	10	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.04	0.23	0.49	0.00	0.03	0.02
Crew Vehicle	0.05	0.36	0.03	0.00	0.01	0.01
Onsite Total	0.09	0.59	0.52	0.00	0.04	0.03
Offsite						
Dump Truck	0.96	5.17	11.19	0.05	0.58	0.44
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	1.22	7.23	11.36	0.05	0.64	0.47
Total	1.31	7.82	11.88	0.06	0.68	0.50

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	6.0	0.0	6.0
Crew Vehicle	3.2	0.0	3.2
Onsite Total	9.2	0.0	9.2
Offsite			
Dump Truck	137.0	0.0	137.0
Worker Commute	18.1	0.0	18.2
Offsite Total	155.1	0.0	155.2
Total	164.3	0.0	164.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	3	Unpaved	17.5	2.145	0.214	112.60	11.26
Crew Vehicle	6	Unpaved	17.5	1.237	0.124	129.84	12.98
Onsite Total						242.44	24.24
Offsite							
Dump Truck	20	Paved	60	0.001	0.000	0.96	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.44	0.00
Total						243.88	24.24

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 10
Substation Construction Emissions
Grading

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	3,078	9.94E-04	2.07E-04	3.06	0.64
Bulldozing, Scraping and Grading	hr/day	42	0.348	0.072	14.60	3.04
Storage Pile Wind Erosion ^d	acres	0.4	44.0	9.15	17.60	3.66
Total					35.26	7.33

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 114,700 CY plus 70,000 CY from borrow pit, total 184,700 CY over 60 days

^d Based on 1,000 CY in each of two cones 9 ft. tall x 100 ft. diameter

**Table 11
Substation Construction Emissions
Fencing**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	2.13	0.99	0.00	0.02	0.02	2.3
Onsite Motor Vehicle Exhaust	0.02	0.13	0.14	0.00	0.01	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	34.63	3.46	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.16	2.27	1.13	0.00	34.66	3.48	2.8
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	4.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	4.5
Total	0.42	4.32	1.30	0.01	35.20	3.52	7.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bobcat	75	1	15	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bobcat	0.14	2.13	0.99	0.00	0.02	0.02
Total	0.14	2.13	0.99	0.00	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bobcat	2.3	0.0	2.3
Total	2.3	0.0	2.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	15	3	7.5
Crewcab Truck	3	15	2	5
Offsite				
Worker Commute	10	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Crewcab Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 11
Substation Construction Emissions
Fencing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.01	0.04	0.05	0.00	0.00	0.00
Crewcab Truck	0.01	0.09	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.13	0.14	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.19	0.31	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crewcab Truck	0.3	0.0	0.3
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	4.5	0.0	4.5
Offsite Total	4.5	0.0	4.5
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	7.5	2.145	0.214	16.09	1.61
Crewcab Truck	3	Unpaved	5	1.237	0.124	18.55	1.85
Onsite Total						34.63	3.46
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						35.11	3.46

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 12
Substation Construction Emissions
Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.68	23.43	10.09	0.04	0.26	0.24	155.6
Onsite Motor Vehicle Exhaust	0.02	0.10	0.21	0.00	0.01	0.01	3.9
Onsite Motor Vehicle Fugitive PM	--	--	--	--	48.26	4.83	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	1.69	23.53	10.30	0.04	48.67	5.11	159.4
Offsite Motor Vehicle Exhaust	1.21	7.48	9.77	0.05	0.58	0.43	215.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	1.21	7.48	9.77	0.05	1.30	0.43	215.6
Total	2.90	31.01	20.07	0.10	49.97	5.53	375.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	152	2	90	4
Foundation Auger	79	2	90	7
Backhoe	79	3	90	6
Skip Loader	75	2	90	3
Bobcat Skid Steer	75	2	90	4
Forklift	83	1	90	4
17-Ton Crane	125	1	90	2

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Foundation Auger	79	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Skip Loader	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts
17-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.41	5.31	1.59	0.01	0.07	0.07
Foundation Auger	0.35	6.52	2.74	0.01	0.03	0.03
Backhoe	0.51	6.08	3.17	0.01	0.10	0.09
Skip Loader	0.10	1.60	0.74	0.00	0.01	0.01
Bobcat Skid Steer	0.14	2.13	0.99	0.00	0.02	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
17-Ton Crane	0.09	0.95	0.46	0.00	0.02	0.02
Total	1.68	23.43	10.09	0.04	0.26	0.24

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	36.7	0.0	36.7
Foundation Auger	44.1	0.0	44.1
Backhoe	38.0	0.0	38.1
Skip Loader	10.5	0.0	10.5
Bobcat Skid Steer	26.2	0.0	26.3
Forklift	0.0	0.0	0.0
17-Ton Crane	0.0	0.0	0.0
Total	155.5	0.0	155.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 12
Substation Construction Emissions
Civil

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	90	2	5
Water Truck	1	90	5	12.5
Offsite				
Concrete Truck	17	90	N/A	60
Worker Commute	15	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Water Truck	0.01	0.05	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.10	0.21	0.00	0.01	0.01
Offsite						
Concrete Truck	0.82	4.40	9.51	0.04	0.50	0.37
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	1.21	7.48	9.77	0.05	0.58	0.43
Total	1.23	7.58	9.98	0.05	0.59	0.44

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	1.7	0.0	1.7
Water Truck	2.1	0.0	2.1
Onsite Total	3.9	0.0	3.9
Offsite			
Concrete Truck	174.7	0.0	174.7
Worker Commute	40.8	0.0	40.8
Offsite Total	215.5	0.0	215.6
Total	219.4	0.0	219.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Water Truck	1	Unpaved	12.5	2.145	0.214	26.81	2.68
Onsite Total						48.26	4.83
Offsite							
Concrete Truck	17	Paved	60	0.001	0.000	0.82	0.00
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						48.98	4.83

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 12
Substation Construction Emissions
Civil

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

**Table 13
Substation Construction Emissions
Control Building**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.09	0.09	0.00	0.00	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	32.17	3.22	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.09	0.09	0.00	32.18	3.22	0.4
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	3.6
Total	0.17	1.32	0.20	0.00	32.50	3.24	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Carry-all Truck	2	20	2	5
Stake Truck	1	20	2	5
Offsite				
Worker Commute	6	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Carry-all Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 13
Substation Construction Emissions
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Carry-all Truck	0.01	0.06	0.06	0.00	0.00	0.00
Stake Truck	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.09	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.17	1.32	0.20	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Carry-all Truck	0.3	0.0	0.3
Stake Truck	0.1	0.0	0.1
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	4.0	0.0	4.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Carry-all Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Stake Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Onsite Total						32.17	3.22
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						32.46	3.22

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 14
Substation Construction Emissions
Electrical

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.85	9.25	6.15	0.02	0.25	0.23	206.2
Onsite Motor Vehicle Exhaust	0.01	0.10	0.01	0.00	0.00	0.00	4.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	37.10	3.71	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.87	9.35	6.16	0.02	37.35	3.94	210.8
Offsite Motor Vehicle Exhaust	0.39	3.08	0.26	0.01	0.09	0.06	136.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	0.39	3.08	0.26	0.01	0.81	0.06	136.1
Total	1.26	12.43	6.41	0.03	38.15	4.00	346.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Scissor Lift	87	2	300	5
Manlift	43	2	300	7
Reach Manlift	87	2	300	6
15-Ton Crane	125	1	300	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Scissor Lift	0.18	2.26	1.50	0.00	0.06	0.06
Manlift	0.23	1.89	1.71	0.00	0.05	0.04
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.85	9.25	6.15	0.02	0.25	0.23

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Scissor Lift	51.8	0.0	51.9
Manlift	37.4	0.0	37.4
Reach Manlift	62.2	0.0	62.2
15-Ton Crane	54.7	0.0	54.7
Total	206.0	0.0	206.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x
days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action
Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	6	300	2	5
Offsite				
Worker Commute	15	300	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 14
Substation Construction Emissions
Electrical

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.10	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	0.39	3.08	0.26	0.01	0.09	0.06
Total	0.40	3.19	0.27	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	4.5	0.0	4.5
Onsite Total	4.5	0.0	4.5
Offsite			
Worker Commute	136.0	0.0	136.1
Offsite Total	136.0	0.0	136.1
Total	140.6	0.0	140.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/ Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	6	Unpaved	5	1.237	0.124	37.10	3.71
Onsite Total						37.10	3.71
Offsite							
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						37.82	3.71

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 15
Substation Construction Emissions
Wiring**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.07	0.54	0.49	0.00	0.01	0.01	8.9
Onsite Motor Vehicle Exhaust	0.01	0.07	0.01	0.00	0.00	0.00	2.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	24.73	2.47	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.08	0.61	0.49	0.00	24.75	2.49	11.4
Offsite Motor Vehicle Exhaust	0.21	1.65	0.14	0.01	0.05	0.03	60.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.21	1.65	0.14	0.01	0.43	0.03	60.5
Total	0.28	2.25	0.63	0.01	25.18	2.52	71.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	1	250	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.07	0.54	0.49	0.00	0.01	0.01

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	8.9	0.0	8.9
Total	8.9	0.0	8.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	250	2	5
Offsite				
Worker Commute	8	250	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 15
Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.07	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.21	1.65	0.14	0.01	0.05	0.03
Total	0.22	1.71	0.14	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	2.5	0.0	2.5
Onsite Total	2.5	0.0	2.5
Offsite			
Worker Commute	60.5	0.0	60.5
Offsite Total	60.5	0.0	60.5
Total	63.0	0.0	63.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	1.237	0.124	24.73	2.47
Onsite Total						24.73	2.47
Offsite							
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.38	0.00
Total						25.12	2.47

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 16
Substation Construction Emissions
Transformers

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.38	4.10	1.98	0.01	0.09	0.08	27.4
Onsite Motor Vehicle Exhaust	0.02	0.11	0.10	0.00	0.01	0.00	2.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	46.18	4.62	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.40	4.21	2.08	0.01	46.27	4.70	30.0
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	27.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	27.2
Total	0.66	6.27	2.25	0.01	46.81	4.74	57.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Crane	125	1	90	6
Forklift	83	1	90	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Crane	0.28	2.85	1.38	0.01	0.07	0.07
Forklift	0.10	1.25	0.60	0.00	0.01	0.01
Total	0.38	4.10	1.98	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Crane	19.7	0.0	19.7
Forklift	7.6	0.0	7.7
Total	27.3	0.0	27.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	90	2	5
Low Bed Truck	1	90	4	10
Offsite				
Worker Commute	10	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Low Bed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 16
Substation Construction Emissions
Transformers

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Low Bed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.10	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.17	0.27	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.9	0.0	0.9
Low Bed Truck	1.7	0.0	1.7
Onsite Total	2.6	0.0	2.6
Offsite			
Worker Commute	27.2	0.0	27.2
Offsite Total	27.2	0.0	27.2
Total	29.8	0.0	29.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	1.237	0.124	24.73	2.47
Low Bed Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Onsite Total						46.18	4.62
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						46.66	4.62

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.02	0.12	0.12	0.00	0.01	0.00	1.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	33.78	3.38	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.02	0.12	0.12	0.00	33.79	3.38	1.6
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	7.3
Total	0.12	0.94	0.19	0.00	34.00	3.40	8.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Maintenance Truck	2	60	4	10
Offsite				
Worker Commute	4	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Maintenance Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Maintenance Truck	0.02	0.12	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.12	0.12	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.94	0.19	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Maintenance Truck	1.6	0.0	1.6
Onsite Total	1.6	0.0	1.6
Offsite			
Worker Commute	7.3	0.0	7.3
Offsite Total	7.3	0.0	7.3
Total	8.8	0.0	8.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Maintenance Truck	2	Unpaved	10	1.689	0.169	33.78	3.38
Onsite Total						33.78	3.38
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						33.98	3.38

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 18
Substation Construction Emissions
Testing**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.05	0.00	0.00	0.00	0.00	1.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	18.55	1.85	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.05	0.00	0.00	18.55	1.86	1.5
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	24.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	24.2
Total	0.11	0.87	0.07	0.00	18.77	1.87	25.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	200	3	7.5
Offsite				
Worker Commute	4	200	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 18
Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.05	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.05	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.87	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	1.5	0.0	1.5
Onsite Total	1.5	0.0	1.5
Offsite			
Worker Commute	24.2	0.0	24.2
Offsite Total	24.2	0.0	24.2
Total	25.7	0.0	25.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Unpaved	7.5	1.237	0.124	18.55	1.85
Onsite Total						18.55	1.85
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						18.74	1.85

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 19
Substation Construction Emissions
Asphalting

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.33	4.62	0.01	0.21	0.19	12.0
Onsite Motor Vehicle Exhaust	0.02	0.11	0.17	0.00	0.01	0.01	1.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	49.90	4.99	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Asphaltic Paving VOC	0.6	--	--	--	--	--	--
Onsite Total	1.52	6.44	4.79	0.01	50.12	5.19	13.2
Offsite Motor Vehicle Exhaust	0.89	5.42	7.45	0.04	0.44	0.32	53.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.11	0.00	
Offsite Total	0.89	5.42	7.45	0.04	1.54	0.32	53.6
Total	2.41	11.86	12.23	0.05	51.66	5.51	66.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Paving Roller	46	2	30	4
Asphalt Paver	152	1	30	4
Tractor	45	1	30	3
Asphalt Curb Machine	35	1	30	3

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Paving Roller	46	0.034	0.226	0.178	0.000	0.007	0.006	25.983	0.003	Rollers
Asphalt Paver	152	0.090	0.754	0.524	0.001	0.029	0.026	128.285	0.008	Pavers
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Asphalt Curb Machine	35	0.047	0.235	0.179	0.000	0.010	0.009	23.927	0.004	Paving Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Paving Roller	0.28	1.81	1.42	0.00	0.05	0.05
Asphalt Paver	0.36	3.02	2.10	0.01	0.11	0.11
Tractor	0.09	0.80	0.57	0.00	0.01	0.01
Asphalt Curb Machine	0.14	0.71	0.54	0.00	0.03	0.03
Total	0.87	6.33	4.62	0.01	0.21	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Paving Roller	2.8	0.0	2.8
Asphalt Paver	7.0	0.0	7.0
Tractor	1.2	0.0	1.2
Asphalt Curb Machine	1.0	0.0	1.0
Total	12.0	0.0	12.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Stake Truck	1	30	4	10
Dump Truck	1	30	3	7.5
Crew Truck	2	30	2	5
Offsite				
Asphalt Delivery Truck	13	30	N/A	60
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Asphalt delivery trucks based on 3,900 CY over 30 days and 10 CY/truck = 3,900 / 30 / 10 = 13

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 19
Substation Construction Emissions
Asphalting

Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Asphalt Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Stake Truck	0.01	0.04	0.09	0.00	0.00	0.00
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.17	0.00	0.01	0.01
Offsite						
Asphalt Delivery Truck	0.63	3.36	7.27	0.03	0.38	0.28
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.89	5.42	7.45	0.04	0.44	0.32
Total	0.91	5.53	7.61	0.04	0.45	0.33

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Stake Truck	0.6	0.0	0.6
Dump Truck	0.4	0.0	0.4
Crew Truck	0.2	0.0	0.2
Onsite Total	1.2	0.0	1.2
Offsite			
Asphalt Delivery Truck	44.5	0.0	44.5
Worker Commute	9.1	0.0	9.1
Offsite Total	53.6	0.0	53.6
Total	54.7	0.0	54.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Stake Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Dump Truck	1	Unpaved	7.5	2.145	0.214	16.09	1.61
Crew Truck	2	Unpaved	5	1.237	0.124	12.37	1.24
Onsite Total						49.90	4.99
Offsite							
Asphalt Delivery Truck	13	Paved	60	0.001	0.000	0.62	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.11	0.00
Total						51.00	4.99

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Asphaltic Paving VOC Emissions

Area Paved (acre/day) ^a	Emission Factor (lb/acre) ^b	VOC (lb/day) ^c
0.24	2.62	0.6

^a Assumed twice daily average for 156,000 ft² total in 30 days:

2 x 156,000 ft² / 30 days / 43,560 ft² per acre = 0.24 acres

^b From URBEMISS 2007 User's Guide, Appendix A,

<http://www.urbemis.com/software/download.html>

^c Emissions [lb/day] = Emission factor [lb/acre] x Area paved [acre/day]

**Table 20
Substation Construction Emissions
Landscaping**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	2.71	1.73	0.00	0.03	0.03	6.9
Onsite Motor Vehicle Exhaust	0.01	0.10	0.08	0.00	0.01	0.00	1.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	40.82	4.08	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.30	2.81	1.80	0.00	40.86	4.12	8.0
Offsite Motor Vehicle Exhaust	1.42	8.26	13.60	0.06	0.76	0.56	136.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.63	0.00	
Offsite Total	1.42	8.26	13.60	0.06	2.39	0.56	136.9
Total	1.72	11.07	15.40	0.07	43.25	4.68	144.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Tractor	45	1	45	7
Forklift	83	1	45	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Tractor	0.22	1.87	1.33	0.00	0.03	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.29	2.71	1.73	0.00	0.03	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Tractor	4.3	0.0	4.3
Forklift	2.5	0.0	2.6
Total	6.9	0.0	6.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	1	45	3	7.5
Crew Truck	4	45	2	5
Offsite				
Crushed Rock Delivery Truck	24	45	N/A	60
Worker Commute	10	45	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Crushed rock delivery trucks based on 10,800 CY over 45 days and 10 CY/truck = 10,800 / 45 / 10 = 24

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Crushed Rock Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 20
Substation Construction Emissions
Landscaping

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.08	0.00	0.01	0.00
Offsite						
Crushed Rock Delivery Truck	1.15	6.21	13.43	0.06	0.70	0.52
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	1.42	8.26	13.60	0.06	0.76	0.56
Total	1.43	8.36	13.68	0.06	0.76	0.57

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.6	0.0	0.6
Crew Truck	0.5	0.0	0.5
Onsite Total	1.1	0.0	1.1
Offsite			
Crushed Rock Delivery Truck	123.3	0.0	123.3
Worker Commute	13.6	0.0	13.6
Offsite Total	136.9	0.0	136.9
Total	138.0	0.0	138.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	1	Unpaved	7.5	2.145	0.214	16.09	1.61
Crew Truck	4	Unpaved	5	1.237	0.124	24.73	2.47
Onsite Total						40.82	4.08
Offsite							
Crushed Rock Delivery Truck	24	Paved	60	0.001	0.000	1.15	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.63	0.00
Total						42.45	4.08

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 21
500 kV Transmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.11	0.89	0.08	0.00	0.03	0.02	0.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	20.42	2.02	
Offsite Total	0.11	0.89	0.08	0.00	20.45	2.04	0.5
Total	0.11	0.89	0.08	0.00	20.45	2.04	0.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1/2-Ton Pick-up Truck, 4x4	2	4	N/A	10
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1/2-Ton Pick-up Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 21
500 kV Transmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1/2-Ton Pick-up Truck, 4x4	0.01	0.07	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.11	0.89	0.08	0.00	0.03	0.02
Total	0.11	0.89	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1/2-Ton Pick-up Truck, 4x4	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	0.5	0.0	0.5
Total	0.5	0.0	0.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1/2-Ton Pick-up Truck, 4x4	2	Unpaved	10	1.012	0.101	20.23	2.02
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						20.42	2.02
Total						20.42	2.02

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.41	3.14	1.79	0.01	0.06	0.06	55.8
Onsite Motor Vehicle Exhaust	0.02	0.10	0.14	0.00	0.01	0.01	4.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	31.13	3.11	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.43	3.24	1.93	0.01	31.20	3.18	59.9
Offsite Motor Vehicle Exhaust	0.20	1.41	0.87	0.01	0.06	0.04	27.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.28	0.00	
Offsite Total	0.20	1.41	0.87	0.01	0.35	0.04	27.9
Total	0.63	4.65	2.81	0.02	31.55	3.22	87.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	137	5
Rough Terrain Forklift	125	1	137	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.27	1.16	1.35	0.01	0.05	0.04
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.41	3.14	1.79	0.01	0.06	0.06

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	34.8	0.0	34.9
Rough Terrain Forklift	20.9	0.0	20.9
Total	55.7	0.0	55.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	1	137	4	10
Jet A Fuel Truck	1	137	0.5	1.25
Water Truck	1	137	1	2.5
Offsite				
Flat Bed Truck/Trailer	1	10	N/A	60
Concrete Mixer Truck	1	10	N/A	10
Jet A Fuel Truck	1	137	N/A	20
Water Truck	1	137	N/A	20
Worker Commute	4	137	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Flat Bed Truck/Trailer	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Jet A Fuel Truck	0.00	0.01	0.01	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.02	0.10	0.14	0.00	0.01	0.01
Offsite						
Flat Bed Truck/Trailer	0.06	0.36	0.37	0.00	0.02	0.01
Concrete Mixer Truck	0.01	0.06	0.06	0.00	0.00	0.00
Jet A Fuel Truck	0.02	0.09	0.19	0.00	0.01	0.01
Water Truck	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.20	1.41	0.87	0.01	0.06	0.04
Total	0.22	1.51	1.02	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Truck, Semi Tractor	1.3	0.0	1.3
Jet A Fuel Truck	0.33	0.00	0.33
Water Truck	0.65	0.00	0.65
Onsite Total	4.1	0.0	4.1
Offsite			
Flat Bed Truck/Trailer	0.8	0.0	0.8
Concrete Mixer Truck	0.1	0.0	0.1
Jet A Fuel Truck	5.21	0.00	5.21
Water Truck	5.21	0.00	5.21
Worker Commute	16.6	0.0	16.6
Offsite Total	27.9	0.0	27.9
Total	32.0	0.0	32.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	1.237	0.124	12.37	1.24
Truck, Semi Tractor	1	Unpaved	5	2.145	0.214	10.72	1.07
Jet A Fuel Truck	1	Unpaved	1.25	2.145	0.214	2.68	0.27
Water Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Onsite Total						31.13	3.11
Offsite							
Flat Bed Truck/Trailer	1	Paved	60	0.001	0.000	0.05	0.00
Concrete Mixer Truck	1	Paved	10	0.001	0.000	0.01	0.00
Jet A Fuel Truck	1	Paved	20	0.00	0.00	0.02	0.00
Water Truck	1	Paved	20	0.00	0.00	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.28	0.00
Total						31.42	3.11

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.09	16.82	9.96	0.05	0.45	0.42	44.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	9.17	1.91	
Onsite Total	2.09	16.82	9.96	0.05	9.63	2.33	44.9
Offsite Motor Vehicle Exhaust	0.28	2.18	0.37	0.01	0.07	0.05	8.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	45.02	4.45	
Offsite Total	0.28	2.18	0.37	0.01	45.09	4.50	8.3
Total	2.37	19.00	10.34	0.05	54.71	6.83	53.1

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	24	6
Backhoe/Front Loader	125	1	24	8
Drum Type Compactor	100	1	24	6
Track Type Dozer	150	1	24	8
Excavator	250	1	24	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final--Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Track Type Dozer	0.66	5.81	3.56	0.01	0.19	0.18
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	2.09	16.82	9.96	0.05	0.45	0.42

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	11.2	0.0	11.3
Backhoe/Front Loader	8.8	0.0	8.8
Drum Type Compactor	3.9	0.0	3.9
Track Type Dozer	10.6	0.0	10.6
Excavator	10.4	0.0	10.4
Total	44.8	0.0	44.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	24	N/A	5
Water Truck	2	24	N/A	5
Lowboy Truck/Trailer	1	24	N/A	5
Worker Commute	10	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Lowboy Truck/Trailer	0.00	0.02	0.05	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.28	2.18	0.37	0.01	0.07	0.05
Total	0.28	2.18	0.37	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.5	0.0	0.5
Lowboy Truck/Trailer	0.2	0.0	0.2
Worker Commute	7.3	0.0	7.3
Offsite Total	8.3	0.0	8.3
Total	8.3	0.0	8.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Water Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Lowboy Truck/Trailer	1	Unpaved	5	2.145	0.214	10.72	1.07
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						45.02	4.45
Total						45.02	4.45

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	4,334	9.94E-04	2.07E-04	4.31	0.90
Bulldozing, Scraping and Grading	hr/day	14	0.348	0.072	4.87	1.01
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					9.17	1.91

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate 80,000 CY of cut plus 50,000 CY of fill yields 130,000 CY of soil handling over 30 days. Approx 4,334 CY/day.

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	28.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	1.38	0.29	
Onsite Total	1.15	15.80	7.68	0.03	1.62	0.51	28.5
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	4.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	4.4
Total	1.30	17.03	7.78	0.03	1.94	0.53	32.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	24	8
Grout Machine	60	1	24	8
Drill Rig	75	1	24	8
Transfer Pump	60	1	24	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	7.7	0.0	7.7
Grout Machine	7.0	0.0	7.0
Drill Rig	6.7	0.0	6.7
Transfer Pump	7.0	0.0	7.0
Total	28.5	0.0	28.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	4.4	0.0	4.4
Offsite Total	4.4	0.0	4.4
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	1,388	9.94E-04	2.07E-04	1.38	0.29
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					1.38	0.29

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Offsite Motor Vehicle Exhaust	0.27	2.03	0.63	0.01	0.07	0.05	1.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	105.11	10.47	
Offsite Total	0.27	2.03	0.63	0.01	105.18	10.52	1.4
Total	1.02	6.57	4.56	0.02	105.34	10.67	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	4	8
Rough Terrain Crane (L)	275	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Rough Terrain Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Rough Terrain Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.75	4.54	3.93	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.7	0.0	0.7
Rough Terrain Crane (L)	2.0	0.0	2.0
Total	2.6	0.0	2.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
1-Ton Flat Bed, 4x4	2	4	N/A	20
Flat Bed Truck/Trailer	1	4	N/A	20
Worker Commute	8	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHV	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
1-Ton Flat Bed, 4x4	0.04	0.24	0.25	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.27	2.03	0.63	0.01	0.07	0.05
Total	0.27	2.03	0.63	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
1-Ton Flat Bed, 4x4	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.2	0.0	0.2
Worker Commute	1.0	0.0	1.0
Offsite Total	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.ciimateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
1-Ton Flat Bed, 4x4	2	Unpaved	20	1.237	0.124	49.46	4.95
Flat Bed Truck/Trailer	1	Unpaved	20	2.145	0.214	42.90	4.29
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						105.11	10.47
Total						105.11	10.47

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Offsite Motor Vehicle Exhaust	0.13	0.97	0.22	0.00	0.03	0.02	0.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	49.27	4.91	
Offsite Total	0.13	0.97	0.22	0.00	49.30	4.93	0.6
Total	0.61	6.89	2.73	0.01	49.41	5.03	1.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	2	8
Backhoe/Front Loader	125	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Total	0.48	5.92	2.51	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.3	0.0	0.3
Backhoe/Front Loader	0.6	0.0	0.6
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	1	4	N/A	5
Dump Truck	1	2	N/A	20
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.00	0.03	0.03	0.00	0.00	0.00
Dump Truck	0.02	0.12	0.12	0.00	0.01	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.22	0.00	0.03	0.02
Total	0.13	0.97	0.22	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.0	0.0	0.0
Dump Truck	0.1	0.0	0.1
Worker Commute	0.5	0.0	0.5
Offsite Total	0.6	0.0	0.6
Total	0.6	0.0	0.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	1	Unpaved	5	1.237	0.124	6.18	0.62
Dump Truck	1	Unpaved	20	2.145	0.214	42.90	4.29
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						49.27	4.91
Total						49.27	4.91

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.73	13.83	6.02	0.05	0.23	0.21	53.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	--
Earthwork Fugitive PM	--	--	--	--	0.20	0.04	--
Onsite Total	1.73	13.83	6.02	0.05	0.43	0.26	53.6
Offsite Motor Vehicle Exhaust	0.28	2.10	0.64	0.01	0.08	0.05	10.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	107.06	10.66	--
Offsite Total	0.28	2.10	0.64	0.01	107.14	10.72	10.1
Total	2.01	15.93	6.66	0.06	107.57	10.97	63.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	30	7
Backhoe/Front Loader	125	1	30	10
Low Drill	385	1	16	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Low Drill	385	0.071	0.551	0.162	0.003	0.006	0.005	311.309	0.006	Bore/Drill Rigs

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.60	2.47	2.78	0.01	0.10	0.09
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Low Drill	0.71	5.51	1.62	0.03	0.06	0.05
Total	1.73	13.83	6.02	0.05	0.23	0.21

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	17.2	0.0	17.2
Backhoe/Front Loader	13.8	0.0	13.8
Low Drill	22.6	0.0	22.6
Total	53.5	0.0	53.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	30	N/A	5
Water Truck	1	30	N/A	5
Dump Truck	1	30	N/A	10
Concrete Mixer Truck	3	18	N/A	10
Worker Commute	9	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Concrete Mixer Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.24	1.85	0.16	0.01	0.05	0.03
Offsite Total	0.28	2.10	0.64	0.01	0.08	0.05
Total	0.28	2.10	0.64	0.01	0.08	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
Water Truck	0.3	0.0	0.3
Dump Truck	0.6	0.0	0.6
Concrete Mixer Truck	1.0	0.0	1.0
Worker Commute	8.2	0.0	8.2
Offsite Total	10.0	0.0	10.1
Total	10.0	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	5	1.012	0.101	10.12	1.01
Water Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Dump Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Concrete Mixer Truck	3	Unpaved	10	2.145	0.214	64.34	6.43
Worker Commute	9	Paved	60	0.001	0.000	0.43	0.00
Offsite Total						107.06	10.66
Total						107.06	10.66

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	200	9.94E-04	2.07E-04	0.20	0.04
Buildozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.20	0.04

^a From Table 57

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

^a Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]
^b Estimate

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	17.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	17.4
Total	1.30	17.03	7.78	0.03	0.56	0.24	122.1

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	96	8
Grout Machine	60	1	80	8
Drill Rig	75	1	96	8
Transfer Pump	60	1	80	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	0.042814	0.500686	0.28637	0.001746	0.0041623	PM2.5 (lb/hr) ^b	164.8678	0.003863	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	30.8	0.0	30.9
Grout Machine	23.5	0.0	23.5
Drill Rig	26.9	0.0	26.9
Transfer Pump	23.5	0.0	23.5
Total	104.6	0.0	104.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	96	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	17.4	0.0	17.4
Offsite Total	17.4	0.0	17.4
Total	17.4	0.0	17.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Offsite Motor Vehicle Exhaust	0.13	0.97	0.32	0.00	0.04	0.02	1.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	55.45	5.53	
Offsite Total	0.13	0.97	0.32	0.00	55.49	5.55	1.7
Total	0.31	3.62	0.90	0.01	55.51	5.57	3.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.18	2.65	0.59	0.01	0.02	0.02
Total	0.18	2.65	0.59	0.01	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	2	10	N/A	5
Flat Bed Truck/Trailer	1	10	N/A	20
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.32	0.00	0.04	0.02
Total	0.13	0.97	0.32	0.00	0.04	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	0.1	0.0	0.1
Flat Bed Truck/Trailer	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.7	0.0	1.7
Total	1.7	0.0	1.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Flat Bed Truck/Trailer	1	Unpaved	20	2.145	0.214	42.90	4.29
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						55.45	5.53
Total						55.45	5.53

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Offsite Motor Vehicle Exhaust	0.29	2.24	0.36	0.01	0.07	0.04	13.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	33.08	3.26	
Offsite Total	0.29	2.24	0.36	0.01	33.14	3.30	13.7
Total	0.98	8.03	3.96	0.02	33.29	3.44	38.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	40	6
RT Crane (M)	215	1	40	6
Compressor Trailer	60	1	40	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.70	5.79	3.60	0.02	0.14	0.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	6.1	0.0	6.1
RT Crane (M)	12.2	0.0	12.2
Compressor Trailer	6.8	0.0	6.8
Total	25.1	0.0	25.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	40	N/A	10
1-Ton Crew Cab Flat Bed, 4x4	2	40	N/A	5
Worker Commute	10	40	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.02	0.12	0.12	0.00	0.01	0.00
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.29	2.24	0.36	0.01	0.07	0.04
Total	0.29	2.24	0.36	0.01	0.07	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.0	0.0	1.0
1-Ton Crew Cab Flat Bed, 4x4	0.5	0.0	0.5
Worker Commute	12.1	0.0	12.1
Offsite Total	13.7	0.0	13.7
Total	13.7	0.0	13.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	10	1.012	0.101	20.23	2.02
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						33.08	3.26
Total						33.08	3.26

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Offsite Motor Vehicle Exhaust	0.38	2.91	0.67	0.01	0.09	0.06	15.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	83.19	8.26	
Offsite Total	0.38	2.91	0.67	0.01	83.29	8.32	15.2
Total	1.46	8.84	6.22	0.03	83.50	8.52	33.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	33	8
RT Crane (M)	215	1	22	6
RT Crane (L)	275	1	11	6

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
RT Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
RT Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	1.07	5.93	5.55	0.02	0.21	0.20

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	5.6	0.0	5.6
RT Crane (M)	6.7	0.0	6.7
RT Crane (L)	5.4	0.0	5.4
Total	17.7	0.0	17.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	3	33	N/A	15
1-Ton Crew Cab Flat Bed, 4x4	2	33	N/A	15
Worker Commute	12	33	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.04	0.27	0.28	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.31	2.47	0.21	0.01	0.07	0.05
Offsite Total	0.38	2.91	0.67	0.01	0.09	0.06
Total	0.38	2.91	0.67	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.9	0.0	1.9
1-Ton Crew Cab Flat Bed, 4x4	1.3	0.0	1.3
Worker Commute	12.0	0.0	12.0
Offsite Total	15.2	0.0	15.2
Total	15.2	0.0	15.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	3	Unpaved	15	1.012	0.101	45.52	4.55
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	15	1.237	0.124	37.10	3.71
Worker Commute	12	Paved	60	0.001	0.000	0.58	0.00
Offsite Total						83.19	8.26
Total						83.19	8.26

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29b

**500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.59	4.56	0.81	0.01	0.14	0.09	5.0
Offsite Helicopter Exhaust	0.23	2.42	1.54	0.00	0.07	0.07	1.36
Offsite Motor Vehicle Fugitive PM	--	--	--	--	93.83	9.29	
Offsite Total	0.82	6.98	2.35	0.02	94.04	9.44	6.4
Total	0.82	6.98	2.35	0.02	94.04	9.44	6.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	8	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.23	2.42	1.54	0.00	0.07	0.07

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	2	N/A	15
1-Ton Truck, 4x4	2	2	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	15
Worker Commute	20	8	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29b
500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Fuel, Helicopter Support Truck	0.01	0.09	0.09	0.00	0.00	0.00
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.59	4.56	0.81	0.01	0.14	0.09
Total	0.59	4.56	0.81	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.1	0.0	0.1
1-Ton Truck, 4x4	0.1	0.0	0.1
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	4.8	0.0	4.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	15	1.012	0.101	30.35	3.03
1-Ton Truck, 4x4	2	Unpaved	15	1.012	0.101	30.35	3.03
Fuel, Helicopter Support Truck	1	Unpaved	15	2.145	0.214	32.17	3.22
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						93.83	9.29
Total						93.83	9.29

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Helicopter Exhaust	46.71	56.80	577.42	32.18	12.02	12.02	1626.43
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Offsite Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4
Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Kaman K-Max	1500	1	120	8
Hughes 500E Helicopter	317	1	127	12
Sikorsky S64	9000	1	7	12

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Kaman K-Max	1500	1.129	1.353	7.403	0.626	0.201	0.201	1978.170	0.055	See note c
Hughes 500E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039	0.019	See note c
Sikorsky S64	9000	1.786	2.088	47.051	2.464	0.966	0.966	7788.012	0.216	See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5, CO2, and CH4 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications,

DETEC, Federal Office of Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009.

Downloaded from <http://www.bazl.admin.ch/experten/regulation/03312/03419/03532/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.75 kg/gal from Table 13.1 of 2013 Climate Registry Default Emission Factors, downloaded from

<http://www.theclimaterestry.org/downloads/2013/01/2013-Climaterestry-Default-Emissions-Factors.pdf>

CH4 emission factor = 0.27 g/gal from Table 13.7 of 2013 Climate Registry Default Emission Factors

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Kaman K-Max	9.03	10.83	59.22	5.01	1.60	1.60
Hughes 500E Helicopter	25.27	31.74	12.80	2.61	0.42	0.42
Sikorsky S64	21.44	25.06	564.62	29.57	11.60	11.60
Total^b	46.71	56.80	577.42	32.18	12.02	12.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

^b Total daily emissions assume that the Kaman K-Max and Sikorsky S64 would not operate on the same day.

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Kaman K-Max	861.4	0.0	861.9
Hughes 500E Helicopter	467.3	0.0	467.6
Sikorsky S64	296.7	0.0	296.9
Total	1,625.5	0.0	1,626.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO2-equivalent (CO2e) emission factors are CO2 emissions plus 21 x CH4 emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateestry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
None				

^a Onsite travel based on 25% use at 10 mph average speed.

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
1-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
Fuel, Helicopter Support Truck	0.00	0.00	0.00	0.00	0.00	0.00
Worker Commute	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
1-Ton Truck, 4x4	0.0	0.0	0.0
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	0.0	0.0	0.0
Offsite Total	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^b Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
None						0.00	0.00
Offsite Total						0.00	0.00
Total						0.00	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	5.93	32.28	29.00	0.15	1.00	0.92	0.00
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	5.93	32.28	29.00	0.15	1.00	0.92	0.0
Offsite Motor Vehicle Exhaust	1.70	12.93	3.12	0.04	0.42	0.29	18.5
Offsite Helicopter Exhaust	12.64	15.87	6.40	1.31	0.21	0.21	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	382.11	37.94	
Offsite Total	14.34	28.80	9.52	1.35	382.75	38.45	18.5
Total	20.27	61.08	38.52	1.51	383.75	39.37	18.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	2	9	8
RT Crane (M)	215	2	9	6
Boom/Crane Truck	350	2	9	6
Spacing Cart	10	2	3	8
Static Truck/Tensioner	350	1	9	6
3 Drum Straw Sock Puller	300	1	4	6
Bull Wheel Puller	525	1	5	6
Sag Cat w/ winches	350	2	9	4
Backhoe/Front Loader	125	1	9	4
D8 Cat	350	2	9	4
Hughes 500 E Helicopter	N/A	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Spacing Cart	10	0.012	0.062	0.074	0.000	0.003	0.003	10.107	0.001	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Sock Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Bull Wheel Puller	525	0.044	0.347	0.202	0.001	0.007	0.006	122.505	0.004	Other Construction Equipment
Sag Cat w/ winches	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
D8 Cat	350	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Hughes 500 E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039		See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5 and CO2 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications, DETEC, Federal Office of

Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009. Downloaded from <http://www.bazl.admin.ch/fachleute/01169/01174/01628/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet-A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.57 kg/gal from Table C.3 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008.

Downloaded from http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.93	5.94	5.86	0.03	0.17	0.16
RT Crane (M)	0.65	2.78	3.25	0.02	0.11	0.10
Boom/Crane Truck	1.03	4.24	4.77	0.02	0.18	0.16
Spacing Cart	0.19	0.99	1.18	0.00	0.05	0.04
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
3 Drum Straw Sock Puller	0.48	2.76	1.82	0.01	0.06	0.05
Bull Wheel Puller	0.27	2.08	1.21	0.01	0.04	0.04
Sag Cat w/ winches	0.63	3.68	2.43	0.02	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
D8 Cat	1.11	4.70	6.02	0.02	0.22	0.21
Hughes 500 E Helicopter	12.64	15.87	6.40	1.31	0.21	0.21
Total	18.56	48.15	35.40	1.46	1.21	1.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	13.9	0.0	13.9
RT Crane (M)	5.5	0.0	5.5
Boom/Crane Truck	8.8	0.0	8.8
Spacing Cart	0.2	0.0	0.2
Static Truck/Tensioner	6.2	0.0	6.2
3 Drum Straw Sock Puller	2.8	0.0	2.8
Bull Wheel Puller	1.7	0.0	1.7
Sag Cat w/ winches	8.3	0.0	8.3
Backhoe/Front Loader	1.7	0.0	1.7
D8 Cat	8.5	0.0	8.5
Hughes 500 E Helicopter	3.7	0.0	3.7
Total	61.2	0.0	61.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	4	9	N/A	20
1-Ton Crew Cab, 4x4	6	9	N/A	20
Wire Truck/Trailer	4	6	N/A	5
Dump Truck	1	9	N/A	5
Lowboy Truck/Trailer	3	9	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	30
Worker Commute	55	9	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Fuel, Helicopter Support Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.07	0.48	0.49	0.00	0.02	0.02
1-Ton Crew Cab, 4x4	0.11	0.71	0.74	0.00	0.03	0.03
Wire Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Dump Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.04	0.19	0.42	0.00	0.02	0.02
Fuel, Helicopter Support Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	1.44	11.31	0.95	0.04	0.32	0.21
Offsite Total	1.70	12.93	3.12	0.04	0.42	0.29
Total	1.70	12.93	3.12	0.04	0.42	0.29

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.9	0.0	0.9
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Wire Truck/Trailer	0.2	0.0	0.2
Dump Truck	0.1	0.0	0.1
Lowboy Truck/Trailer	0.8	0.0	0.8
Fuel, Helicopter Support Truck	0.1	0.0	0.1
Worker Commute	15.0	0.0	15.0
Offsite Total	18.5	0.0	18.5
Total	18.5	0.0	18.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	4	Unpaved	20	1.012	0.101	80.93	8.09
1-Ton Crew Cab, 4x4	6	Unpaved	20	1.237	0.124	148.39	14.84
Wire Truck/Trailer	4	Unpaved	5	2.145	0.214	42.90	4.29
Dump Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Lowboy Truck/Trailer	3	Unpaved	15	2.145	0.214	96.51	9.65
Fuel, Helicopter Support Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	55	Paved	60	0.001	0.000	2.64	0.00
Offsite Total						382.11	37.94
Total						382.11	37.94

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.75	4.42	0.02	0.19	0.17	3.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	2.58	0.54	
Onsite Total	0.87	6.75	4.42	0.02	2.77	0.71	3.3
Offsite Motor Vehicle Exhaust	0.20	1.56	0.32	0.01	0.05	0.03	1.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	44.87	4.45	
Offsite Total	0.20	1.56	0.32	0.01	44.92	4.49	1.0
Total	1.08	8.31	4.75	0.03	47.70	5.20	4.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	4	6
Backhoe/Front Loader	125	1	4	4
Drum Type Compactor	100	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.87	6.75	4.42	0.02	0.19	0.17

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	1.9	0.0	1.9
Backhoe/Front Loader	0.7	0.0	0.7
Drum Type Compactor	0.6	0.0	0.6
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
Water Truck	1	4	N/A	5
Lowboy Truck/Trailer	1	4	N/A	10
Worker Commute	7	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.01	0.04	0.09	0.00	0.00	0.00
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.20	1.56	0.32	0.01	0.05	0.03
Total	0.20	1.56	0.32	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
Water Truck	0.0	0.0	0.0
Lowboy Truck/Trailer	0.1	0.0	0.1
Worker Commute	0.8	0.0	0.8
Offsite Total	1.0	0.0	1.0
Total	1.0	0.0	1.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Water Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Lowboy Truck/Trailer	1	Unpaved	10	2.145	0.214	21.45	2.14
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						44.87	4.45
Total						44.87	4.45

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day	6	0.348	0.072	2.09	0.43
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					2.58	0.54

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.12	0.96	0.08	0.00	0.03	0.02	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5
Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	18	8	20
Worker Commute	4	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.02	0.14	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.12	0.96	0.08	0.00	0.03	0.02
Total	0.12	0.96	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.4	0.0	0.4
Worker Commute	2.2	0.0	2.2
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	20	0.001	0.000	0.03	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.25	2.45	0.98	0.01	0.04	0.03	92.9
Onsite Motor Vehicle Exhaust	0.01	0.08	0.11	0.00	0.01	0.00	8.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	23.09	2.31	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.26	2.53	1.09	0.01	23.13	2.35	101.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	44.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	44.2
Total	0.36	3.35	1.16	0.01	23.35	2.36	145.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	365	2
Rough Terrain Forklift	125	1	365	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.11	0.46	0.54	0.00	0.02	0.02
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.25	2.45	0.98	0.01	0.04	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	37.1	0.0	37.2
Rough Terrain Forklift	55.7	0.0	55.7
Total	92.8	0.0	92.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4	1	365	4	10
Truck, Semi Tractor	1	365	2	5
Offsite				
Worker Commute	4	365	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Truck, Semi Tractor	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Onsite Total	0.01	0.08	0.11	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.90	0.18	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	4.8	0.0	4.8
Truck, Semi Tractor	3.5	0.0	3.5
Onsite Total	8.2	0.0	8.2
Offsite			
Worker Commute	44.1	0.0	44.2
Offsite Total	44.1	0.0	44.2
Total	52.4	0.0	52.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	1.237	0.124	12.37	1.24
Truck, Semi Tractor	1	Unpaved	5	2.145	0.214	10.72	1.07
Onsite Total						23.09	2.31
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						23.28	2.31

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.60	12.73	7.49	0.04	0.34	0.31	109.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	2.14	0.21	
Earthwork Fugitive PM	--	--	--	--	3.58	0.74	
Onsite Total	1.60	12.73	7.50	0.04	6.06	1.27	109.5
Offsite Motor Vehicle Exhaust	0.18	1.34	0.55	0.01	0.05	0.04	19.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.18	1.34	0.55	0.01	0.34	0.04	19.3
Total	1.79	14.07	8.05	0.04	6.40	1.31	128.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	88	4
Backhoe/Front Loader	125	1	88	6
Drum Type Compactor	100	1	88	4
Track Type Dozer	150	1	88	6
Excavator	250	1	44	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.31	1.42	1.46	0.01	0.05	0.05
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.16	1.52	1.06	0.00	0.05	0.05
Track Type Dozer	0.49	4.36	2.67	0.01	0.14	0.13
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	1.60	12.73	7.49	0.04	0.34	0.31

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	27.5	0.0	27.5
Backhoe/Front Loader	24.3	0.0	24.3
Drum Type Compactor	9.4	0.0	9.4
Track Type Dozer	29.0	0.0	29.1
Excavator	19.0	0.0	19.0
Total	109.2	0.0	109.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	88	8	1
Offsite				
1-Ton Crew Cab, 4x4	1	88	N/A	30
Lowboy Truck/Trailer	1	44	N/A	30
Worker Commute	5	88	N/A	60

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.13	1.03	0.09	0.00	0.03	0.02
Offsite Total	0.18	1.34	0.55	0.01	0.05	0.04
Total	0.18	1.34	0.56	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab, 4x4	3.5	0.0	3.5
Lowboy Truck/Trailer	2.5	0.0	2.5
Worker Commute	13.3	0.0	13.3
Offsite Total	19.3	0.0	19.3
Total	19.4	0.0	19.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	2.145	0.214	2.14	0.21
Onsite Total						2.14	0.21
Offsite							
1-Ton Crew Cab, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	5	Paved	60	0.001	0.000	0.24	0.00
Offsite Total						0.29	0.00
Total						2.43	0.21

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	100	9.94E-04	2.07E-04	0.10	0.02
Bulldozing, Scraping and Grading	hr/day	10	0.348	0.072	3.48	0.72
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					3.58	0.74

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Offsite Motor Vehicle Exhaust	0.26	1.90	0.94	0.01	0.07	0.05	9.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.26	1.90	0.94	0.01	0.46	0.05	9.3
Total	1.61	10.08	7.33	0.05	0.69	0.27	53.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	26	6
Auger Truck	210	1	26	6
Boom/Crane Truck	350	1	26	8
Bucket Truck	250	1	26	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.17	1.81	1.16	0.00	0.05	0.05
Auger Truck	0.26	2.06	0.59	0.01	0.02	0.02
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.35	8.18	6.39	0.04	0.23	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	3.3	0.0	3.3
Auger Truck	13.3	0.0	13.3
Boom/Crane Truck	17.0	0.0	17.0
Bucket Truck	10.0	0.0	10.0
Total	43.7	0.0	43.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Pick-up Truck, 4x4	2	26	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	26	N/A	30
Extendable Flat Bed Pole Truck	1	26	N/A	30
Worker Commute	6	26	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Pick-up Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Pick-up Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.26	1.90	0.94	0.01	0.07	0.05
Total	0.26	1.90	0.94	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Pick-up Truck, 4x4	2.0	0.0	2.0
1-Ton Crew Cab Flat Bed, 4x4	1.0	0.0	1.0
Extendable Flat Bed Pole Truck	1.5	0.0	1.5
Worker Commute	4.7	0.0	4.7
Offsite Total	9.3	0.0	9.3
Total	9.3	0.0	9.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Pick-up Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.38	0.00
Total						0.38	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	7.3
Total	1.07	7.58	4.97	0.02	0.60	0.20	24.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	23	4
Boom/Crane Truck	350	1	23	6
Compressor Trailer	60	1	23	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.09	1.32	0.29	0.00	0.01	0.01
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.84	5.86	4.22	0.02	0.17	0.16

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.3	0.0	2.3
Boom/Crane Truck	11.3	0.0	11.3
Compressor Trailer	3.9	0.0	3.9
Total	17.5	0.0	17.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	23	N/A	30
Flat Bed Truck/Trailer	1	23	N/A	30
Worker Commute	6	23	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Flat Bed Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Flat Bed Truck/Trailer	1.3	0.0	1.3
Worker Commute	4.2	0.0	4.2
Offsite Total	7.3	0.0	7.3
Total	7.3	0.0	7.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Flat Bed Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	2.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	2.0
Total	0.98	5.99	4.23	0.02	0.69	0.18	5.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	5	5
Boom/Crane Truck	350	1	5	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.5	0.0	0.5
Boom/Crane Truck	2.5	0.0	2.5
Total	3.0	0.0	3.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Truck, 4x4	2	5	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	5	N/A	30
Worker Commute	8	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.4	0.0	0.4
1-Ton Crew Cab Flat Bed, 4x4	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.11	9.18	4.06	0.03	0.16	0.15	119.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	2.14	0.21	
Earthwork Fugitive PM	--	--	--	--	0.03	0.01	
Onsite Total	1.11	9.18	4.07	0.03	2.34	0.37	119.2
Offsite Motor Vehicle Exhaust	0.31	2.14	1.43	0.01	0.11	0.08	40.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.31	2.14	1.43	0.01	0.49	0.08	40.7
Total	1.41	11.32	5.50	0.05	2.83	0.44	159.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	96	5
Backhoe/Front Loader	125	1	96	8
Auger Truck	210	1	65	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.43	1.77	1.99	0.01	0.07	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Auger Truck	0.34	2.74	0.78	0.02	0.03	0.03
Total	1.11	9.18	4.06	0.03	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	39.2	0.0	39.2
Backhoe/Front Loader	35.3	0.0	35.3
Auger Truck	44.4	0.0	44.4
Total	118.9	0.0	119.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	96	8	1
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	1	96	N/A	30
Dump Truck	1	96	N/A	30
Concrete Mixer Truck	3	65	N/A	30
Worker Commute	7	96	N/A	60

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Concrete Mixer Truck	0.07	0.39	0.84	0.00	0.04	0.03
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.31	2.14	1.43	0.01	0.11	0.08
Total	0.31	2.14	1.43	0.01	0.11	0.08

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	3.8	0.0	3.8
Dump Truck	5.5	0.0	5.5
Concrete Mixer Truck	11.1	0.0	11.1
Worker Commute	20.3	0.0	20.3
Offsite Total	40.7	0.0	40.7
Total	40.9	0.0	40.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	2.145	0.214	2.14	0.21
Onsite Total						2.14	0.21
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.38	0.00
Total						2.53	0.21

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	35	9.94E-04	2.07E-04	0.03	0.01
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.03	0.01

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	32.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	32.8
Total	0.70	3.43	3.10	0.02	0.41	0.12	95.6

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	128	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.51	2.12	2.39	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	62.7	0.0	62.8
Total	62.7	0.0	62.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	128	N/A	30
40' Flat Bed Pole Truck	1	128	N/A	30
Worker Commute	4	128	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
40' Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
40' Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	10.0	0.0	10.0
40' Flat Bed Pole Truck	7.3	0.0	7.3
Worker Commute	15.5	0.0	15.5
Offsite Total	32.8	0.0	32.8
Total	32.8	0.0	32.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
40' Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Offsite Motor Vehicle Exhaust	0.73	5.39	2.11	0.02	0.20	0.14	83.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.15	0.00	
Offsite Total	0.73	5.39	2.11	0.02	1.36	0.14	83.2
Total	5.07	29.37	24.43	0.15	2.08	0.80	541.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	4	89	8
Boom/Crane Truck	350	2	89	8
Splicing Rig	350	1	20	2
3 Drum Straw Line Puller	300	1	45	6
Static Truck/Tensioner	350	1	45	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Splicing Rig	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Line Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	1.86	11.87	11.71	0.07	0.35	0.32
Boom/Crane Truck	1.37	5.66	6.36	0.03	0.23	0.21
Splicing Rig	0.16	0.92	0.61	0.00	0.02	0.02
3 Drum Straw Line Puller	0.48	2.76	1.82	0.01	0.06	0.05
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
Total	4.34	23.98	22.32	0.13	0.72	0.66

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	275.0	0.0	275.1
Boom/Crane Truck	116.3	0.0	116.4
Splicing Rig	4.6	0.0	4.6
3 Drum Straw Line Puller	31.1	0.0	31.2
Static Truck/Tensioner	31.1	0.0	31.2
Total	458.2	0.0	458.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	89	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	3	89	N/A	30
Wire Truck/Trailer	2	60	N/A	30
Dump Truck	1	89	N/A	30
Worker Commute	20	89	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.08	0.54	0.55	0.00	0.03	0.02
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.73	5.39	2.11	0.02	0.20	0.14
Total	0.73	5.39	2.11	0.02	0.20	0.14

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	7.0	0.0	7.0
1-Ton Crew Cab Flat Bed, 4x4	10.5	0.0	10.5
Wire Truck/Trailer	6.9	0.0	6.9
Dump Truck	5.1	0.0	5.1
Worker Commute	53.8	0.0	53.8
Offsite Total	83.2	0.0	83.2
Total	83.2	0.0	83.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	3	Paved	30	0.001	0.000	0.07	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						1.15	0.00
Total						1.15	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.92	12.58	7.81	0.05	0.29	0.27	10.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.80	0.17	
Onsite Total	1.92	12.58	7.81	0.05	1.09	0.43	10.0
Offsite Motor Vehicle Exhaust	0.70	5.00	2.80	0.02	0.23	0.17	5.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.10	0.00	
Offsite Total	0.70	5.00	2.80	0.02	1.34	0.17	5.3
Total	2.63	17.58	10.62	0.07	2.43	0.60	15.3

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	250	1	5	10
Crane (L)	500	1	5	10
Backhoe/Front Loader	125	1	5	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators
Crane (L)	500	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.65	3.21	2.22	0.02	0.07	0.07
Crane (L)	0.86	3.54	3.98	0.02	0.15	0.13
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Total	1.92	12.58	7.81	0.05	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	3.6	0.0	3.6
Crane (L)	4.1	0.0	4.1
Backhoe/Front Loader	2.3	0.0	2.3
Total	10.0	0.0	10.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	5	N/A	50
Water Truck	1	5	N/A	25
Concrete Mixer Truck	3	5	N/A	25
Dump Truck	3	5	N/A	25
Lowboy Truck/Trailer	1	5	N/A	25
Flat Bed Truck/Trailer	3	5	N/A	25
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

1-Ton Crew Cab, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.06	0.32	0.70	0.00	0.04	0.03
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.70	5.00	2.80	0.02	0.23	0.17
Total	0.70	5.00	2.80	0.02	0.23	0.17

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.2	0.0	0.2
Concrete Mixer Truck	0.7	0.0	0.7
Dump Truck	0.7	0.0	0.7
Lowboy Truck/Trailer	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.7	0.0	0.7
Worker Commute	2.5	0.0	2.5
Offsite Total	5.3	0.0	5.3
Total	5.3	0.0	5.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Flat Bed Truck/Trailer	3	Paved	25	0.001	0.000	0.06	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.10	0.00
Total						1.10	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	49.28	9.94E-04	2.07E-04	0.05	0.01

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.017	44.0	9.15	0.75	0.16
Total					0.80	0.17

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling volume based on a vault size of approximately 24 feet long, 14 feet wide, 12 feet deep. Approximately 0.33 vaults built per day. 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day

Storage pile size based on a 1 vault volume of 4032 cubic feet of soil. Storage pile assumed maximum 48 feet long, 14 feet wide, 6 feet high. 48 feet x 14 feet = 720 square feet = 0.017 acres

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.71	8.86	3.54	0.02	0.16	0.15	10.1
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	1.37	0.28	
Onsite Total	0.71	8.86	3.54	0.02	1.53	0.43	10.1
Offsite Motor Vehicle Exhaust	0.68	4.89	2.57	0.02	0.22	0.16	7.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.08	0.00	
Offsite Total	0.68	4.89	2.57	0.02	1.31	0.16	7.5
Total	1.39	13.75	6.11	0.04	2.84	0.59	17.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe/Front Loader	125	1	15	10
Compressor Trailer	60	1	15	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Compressor Trailer	0.29	3.02	1.93	0.01	0.09	0.08
Total	0.71	8.86	3.54	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe/Front Loader	6.9	0.0	6.9
Compressor Trailer	3.2	0.0	3.2
Total	10.1	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
Lowboy Truck/Trailer	1	15	N/A	25
1-Ton Truck, 4x4	2	15	N/A	50
Water Truck	1	15	N/A	25
Pipe Truck/Trailer	1	15	N/A	25
Concrete Mixer Truck	3	15	N/A	25
Dump Truck	3	15	N/A	25
Lowboy Truck/Trailer	1	1	N/A	25
Worker Commute	20	1	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Pipe Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Pipe Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.68	4.89	2.57	0.02	0.22	0.16
Total	0.68	4.89	2.57	0.02	0.22	0.16

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
Lowboy Truck/Trailer	0.7	0.0	0.7
1-Ton Truck, 4x4	0.8	0.0	0.8
Water Truck	0.5	0.0	0.5
Pipe Truck/Trailer	0.7	0.0	0.7
Concrete Mixer Truck	2.1	0.0	2.1
Dump Truck	2.1	0.0	2.1
Lowboy Truck/Trailer	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	7.5	0.0	7.5
Total	7.5	0.0	7.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/ Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Pipe Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.08	0.00
Total						1.08	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	92.28	9.94E-04	2.07E-04	0.09	0.02
Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.029	44.0	9.15	1.28	0.27
Total					1.37	0.28

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling cubic yards/day based on approximately 250 feet of trenching per day, 24 inches wide x 60 inches deep. 83 yards x 0.867 yards x 1.667 yards = 92.28 cubic yards/day

Storage pile acres based on approximately 250 feet of trenching per day, 60 inches wide x 24 inches high. 83 yards x 1.667 yards = 138.361 square yards = 0.029 acres

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Offsite Motor Vehicle Exhaust	0.53	4.03	0.88	0.01	0.14	0.09	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.93	0.00	
Offsite Total	0.53	4.03	0.88	0.01	1.06	0.09	3.3
Total	3.51	19.09	13.63	0.09	1.50	0.50	94.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	25	10
Manlift/Bucket Truck	250	1	25	10
Puller	350	1	25	10
Static Truck/Tensioner	350	1	25	10

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Manlift/Bucket Truck	250	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Puller	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

^c From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.86	3.54	3.98	0.02	0.15	0.13
Manlift/Bucket Truck	0.54	2.32	2.71	0.01	0.09	0.09
Puller	0.79	4.61	3.03	0.02	0.10	0.09
Static Truck/Tensioner	0.79	4.61	3.03	0.02	0.10	0.09
Total	2.99	15.06	12.75	0.08	0.44	0.40

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	20.4	0.0	20.4
Manlift/Bucket Truck	12.7	0.0	12.7
Puller	28.8	0.0	28.8
Static Truck/Tensioner	28.8	0.0	28.8
Total	90.8	0.0	90.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/ Veh.
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	5	N/A	50
Wire Truck/Trailer	2	5	N/A	30
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.53	4.03	0.88	0.01	0.14	0.09
Total	0.53	4.03	0.88	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.3	0.0	0.3
Wire Truck/Trailer	0.6	0.0	0.6
Worker Commute	2.5	0.0	2.5
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^b Emission factors are in Table 54 and Table 55

^c CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						0.93	0.00
Total						0.93	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	5.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	5.7
Total	1.50	9.66	7.71	0.04	0.69	0.29	29.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	2	18	6
Boom/Crane Truck	350	1	18	8
Bucket Truck	250	1	18	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.35	3.63	2.31	0.01	0.11	0.10
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.27	7.94	6.96	0.03	0.27	0.25

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	4.6	0.0	4.6
Boom/Crane Truck	11.8	0.0	11.8
Bucket Truck	7.0	0.0	7.0
Total	23.3	0.0	23.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	1	18	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	18	N/A	30
Extendable Flat Bed Pole Truck	1	18	N/A	30
Worker Commute	6	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.7	0.0	0.7
1-Ton Crew Cab Flat Bed, 4x4	0.7	0.0	0.7
Extendable Flat Bed Pole Truck	1.0	0.0	1.0
Worker Commute	3.3	0.0	3.3
Offsite Total	5.7	0.0	5.7
Total	5.7	0.0	5.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.96	7.91	4.75	0.02	0.20	0.19	16.3
Onsite Motor Vehicle Exhaust	0.00	0.01	0.03	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	6.43	0.64	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.96	7.93	4.78	0.02	6.64	0.83	16.4
Offsite Motor Vehicle Exhaust	0.26	1.93	0.77	0.01	0.07	0.05	6.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.41	0.00	
Offsite Total	0.26	1.93	0.77	0.01	0.48	0.05	6.3
Total	1.22	9.85	5.55	0.03	7.12	0.88	22.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	18	6
Backhoe/Front Loader	125	1	18	6
Drum Type Compactor	100	1	18	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.96	7.91	4.75	0.02	0.20	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	8.4	0.0	8.4
Backhoe/Front Loader	5.0	0.0	5.0
Drum Type Compactor	2.9	0.0	2.9
Total	16.3	0.0	16.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	18	8	3
Offsite				
1-Ton Crew Cab, 4x4	2	18	N/A	30
Lowboy Truck/Trailer	1	18	N/A	30
Worker Commute	7	18	N/A	60

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.01	0.03	0.00	0.00	0.00
Onsite Total	0.00	0.01	0.03	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.26	1.93	0.77	0.01	0.07	0.05
Total	0.26	1.94	0.80	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Lowboy Truck/Trailer	1.0	0.0	1.0
Worker Commute	3.8	0.0	3.8
Offsite Total	6.2	0.0	6.3
Total	6.4	0.0	6.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	3	2.145	0.214	6.43	0.64
Onsite Total						6.43	0.64
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.41	0.00
Total						6.84	0.64

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 45
Telecommunications Construction
Tower Foundation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.53	6.74	3.59	0.01	0.11	0.10	2.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.50	0.10	
Onsite Total	0.53	6.74	3.59	0.01	0.61	0.21	2.4
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	1.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	1.3
Total	0.71	8.05	4.31	0.02	0.93	0.25	3.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	5	8
Concrete Mixer	120	1	5	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Concrete Mixer	120	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Concrete Mixer	0.30	4.04	2.18	0.01	0.07	0.06
Total	0.53	6.74	3.59	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	0.9	0.0	0.9
Concrete Mixer	1.5	0.0	1.5
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	5	N/A	30
Stake Truck	1	5	N/A	30
Worker Commute	4	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 45
Telecommunications Construction
Tower Foundation

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Stake Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Stake Truck	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	1.3	0.0	1.3
Total	1.3	0.0	1.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Stake Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.50	0.10

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 46
Telecommunications Construction
Tower Construction

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Offsite Motor Vehicle Exhaust	0.16	1.18	0.44	0.00	0.04	0.03	6.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.24	0.00	
Offsite Total	0.16	1.18	0.44	0.00	0.28	0.03	6.0
Total	0.99	5.82	4.82	0.02	0.45	0.18	29.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Crane	300	1	30	8
150-Foot Lift Truck	100	1	30	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Crane	300	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Crane	0.69	2.83	3.18	0.01	0.12	0.11
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.83	4.64	4.38	0.02	0.17	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Crane	19.6	0.0	19.6
150-Foot Lift Truck	4.1	0.0	4.1
Total	23.8	0.0	23.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	30	N/A	30
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 46
Telecommunications Construction
Tower Construction

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.16	1.18	0.44	0.00	0.04	0.03
Total	0.16	1.18	0.44	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	2.4	0.0	2.4
Worker Commute	3.6	0.0	3.6
Offsite Total	6.0	0.0	6.0
Total	6.0	0.0	6.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.24	0.00
Total						0.24	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 47
Telecommunications Construction
Dish Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	1.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	1.6
Total	0.27	2.81	1.45	0.01	0.30	0.07	3.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Lift Truck	100	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.14	1.81	1.20	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Lift Truck	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	10	N/A	30
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 47
Telecommunications Construction
Dish Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.6	0.0	1.6
Total	1.6	0.0	1.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 48
Telecommunications Construction
Control Building

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Offsite Motor Vehicle Exhaust	0.08	0.59	0.22	0.00	0.02	0.01	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.12	0.00	
Offsite Total	0.08	0.59	0.22	0.00	0.14	0.01	2.5
Total	0.54	3.56	3.15	0.02	0.23	0.09	21.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	25	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	19.3	0.0	19.3
Total	19.3	0.0	19.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	25	N/A	30
Worker Commute	2	25	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 48
Telecommunications Construction
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.59	0.22	0.00	0.02	0.01
Total	0.08	0.59	0.22	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	1.0	0.0	1.0
Worker Commute	1.5	0.0	1.5
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.12	0.00
Total						0.12	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 49
Telecommunications Construction
Overhead Communications Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	5.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	5.0
Total	0.60	3.97	3.18	0.02	0.33	0.10	28.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	31	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	23.9	0.0	24.0
Total	23.9	0.0	24.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Reel Truck	1	31	N/A	30
Worker Commute	4	31	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Reel Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 49
Telecommunications Construction
Overhead Communications Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Reel Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Reel Truck	1.2	0.0	1.2
Worker Commute	3.7	0.0	3.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Reel Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.08	0.62	0.05	0.00	0.02	0.01	0.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.14	0.00	
Offsite Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9
Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Van	2	10	N/A	30
Worker Commute	2	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Van	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Van	0.03	0.21	0.02	0.00	0.01	0.00
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.62	0.05	0.00	0.02	0.01
Total	0.08	0.62	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Van	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	0.9	0.0	0.9
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Van	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.14	0.00
Total						0.14	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.32	1.84	1.21	0.01	0.04	0.04	13.8
Onsite Motor Vehicle Exhaust	0.03	0.21	0.22	0.00	0.01	0.01	1.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	35.40	3.54	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.35	2.05	1.43	0.01	35.45	3.58	15.2
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	3.6
Total	0.45	2.87	1.50	0.01	35.67	3.60	18.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
1-Ton Truck	300	1	30	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
1-Ton Truck	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
1-Ton Truck	0.32	1.84	1.21	0.01	0.04	0.04
Total	0.32	1.84	1.21	0.01	0.04	0.04

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
1-Ton Truck	13.8	0.0	13.8
Total	13.8	0.0	13.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Truck, 4x4	3	30	4	10
Van	1	30	2	5
Offsite				
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Van	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Van	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.03	0.21	0.22	0.00	0.01	0.01
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.14	1.03	0.28	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Truck, 4x4	1.2	0.0	1.2
Van	0.2	0.0	0.2
Onsite Total	1.4	0.0	1.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Truck, 4x4	3	Unpaved	10	1.012	0.101	30.35	3.03
Van	1	Unpaved	5	1.012	0.101	5.06	0.51
Onsite Total						35.40	3.54
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						35.60	3.54

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 51b

Additional Substation Construction Emissions

Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO ₂ e (MT)
Construction Equipment Exhaust	0.78	9.91	3.89	0.02	0.14	0.12	7.4
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	10.72	1.07	
Earthwork Fugitive PM	--	--	--	--	0.02	0.00	
Onsite Total	0.78	9.93	3.94	0.02	10.89	1.20	7.5
Offsite Motor Vehicle Exhaust	0.38	2.47	2.36	0.01	0.16	0.11	4.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.38	2.47	2.36	0.01	0.49	0.11	4.4
Total	1.16	12.41	6.30	0.03	11.38	1.32	11.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator with Auger Attachment	152	1	10	8
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4
Forklift	83	1	10	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO ₂ (lb/hr) ^a	CH ₄ (lb/hr) ^a	Category
Excavator with Auger Attachment	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator with Auger Attachment	0.41	5.31	1.59	0.01	0.07	0.07
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.78	9.91	3.89	0.02	0.14	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO ₂ (MT) ^a	CH ₄ (MT) ^a	CO ₂ e (MT) ^b
Excavator with Auger Attachment	4.1	0.0	4.1
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Forklift	0.0	0.0	0.0
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	4	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO ₂ (lb/mi) ^a	CH ₄ (lb/mi) ^a
Onsite									

Table 51b

Additional Substation Construction Emissions

Civil

Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Offsite										
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05	

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.19	1.03	2.24	0.01	0.12	0.09
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.38	2.47	2.36	0.01	0.16	0.11
Total	0.38	2.50	2.41	0.01	0.16	0.12

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	2.3	0.0	2.3
Worker Commute	2.1	0.0	2.1
Offsite Total	4.4	0.0	4.4
Total	4.5	0.0	4.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	2.145	0.214	5.36	0.54
Water Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Onsite Total						10.72	1.07
Offsite							
Concrete Truck	4	Paved	60	0.001	0.000	0.19	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						11.06	1.07

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	24	9.94E-04	2.07E-04	0.02	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.02	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated at 24 CY

Table 51c
Additional Substation Construction Emissions
Electrical

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.14	11.25	7.51	0.02	0.29	0.27	15.5
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.01	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	11.27	7.51	0.02	0.30	0.27	15.6
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	1.41	13.32	7.68	0.03	0.84	0.31	24.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	4	30	7
Reach Manlift	87	2	30	6
15-Ton Crane	125	2	5	5

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.47	3.78	3.41	0.01	0.10	0.09
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.46	4.74	2.30	0.01	0.12	0.11
Total	1.14	11.25	7.51	0.02	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	7.5	0.0	7.5
Reach Manlift	6.2	0.0	6.2
15-Ton Crane	1.8	0.0	1.8
Total	15.5	0.0	15.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	10	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 51c
Additional Substation Construction Emissions
Electrical

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.08	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.2	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	10	Paved	0.625	0.001	0.000	0.01	0.00
Onsite Total						0.01	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.49	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51d

Additional Substation Construction Emissions
Wiring

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.17	1.90	1.38	0.00	0.05	0.05	3.6
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.17	1.92	1.39	0.00	0.06	0.05	3.7
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	0.44	3.97	1.56	0.01	0.59	0.09	12.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Reach Manlift	87	2	30	3
Manlift	43	1	15	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

<http://www.aqmd.gov/ceqa/handbook/PM2.5/PM2.5.html>

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Reach Manlift	0.11	1.36	0.90	0.00	0.04	0.03
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.17	1.90	1.38	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Reach Manlift	3.1	0.0	3.1
Manlift	0.5	0.0	0.5
Total	3.6	0.0	3.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	8	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51d
Additional Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.07	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.1	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	8	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51e

Additional Substation Construction Emissions

Testing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	2.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	2.4
Total	0.11	0.83	0.07	0.00	0.22	0.02	2.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	20	0.25	0.625
Offsite				
Worker Commute	4	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51e
Additional Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.83	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	2.4	0.0	2.4
Offsite Total	2.4	0.0	2.4
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						0.19	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	3.77	1.90	0.01	0.05	0.05	3.3
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	10.72	1.07	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	0.30	3.79	1.95	0.01	10.92	1.15	3.4
Offsite Motor Vehicle Exhaust	0.28	1.96	1.24	0.01	0.10	0.07	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.28	1.96	1.24	0.01	0.44	0.07	3.3
Total	0.58	5.75	3.19	0.02	11.35	1.22	6.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Total	0.29	3.77	1.90	0.01	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	2	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed
^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.10	0.52	1.12	0.00	0.06	0.04
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.28	1.96	1.24	0.01	0.10	0.07
Total	0.28	1.98	1.29	0.01	0.10	0.07

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	1.1	0.0	1.1
Worker Commute	2.1	0.0	2.1
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	2.145	0.214	5.36	0.54
Water Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Onsite Total						10.72	1.07
Offsite							
Concrete Truck	2	Paved	60	0.001	0.000	0.10	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						11.06	1.07

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

Table 52
Operational Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT/yr)
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00	8
Motor Vehicle Exhaust	0.08	0.64	0.05	0.00	0.02	0.01	2
Motor Vehicle Fugitive PM	--	--	--	--	5.20	0.51	--
SF6 Leakage	--	--	--	--	--	--	660
Total	0.17	1.22	0.62	0.01	5.24	0.52	670

Emergency Diesel Generator Usage

Equipment	Horse-power	Number	Days Used/Year	Hours Used/Day
Emergency Diesel Generator	440	1	52	1

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Emergency Diesel Generator	440	0.086	0.582	0.570	0.003	0.017	0.000	336.853	0.008	Generator Sets

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Emergency Diesel Generator Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00
Total	0.09	0.58	0.57	0.00	0.02	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Emergency Diesel Generator Annual Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Emergency Diesel Generator	7.9	0.0	7.9
Total	7.9	0.0	7.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used/Year	Miles/Day/Veh.
Transmission Line Inspection	1	1	65
Subtransmission Line Inspection	1	1	62
Substation Site Visit	1	48	60

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Transmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Subtransmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Substation Site Visit	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Transmission Line Inspection	0.03	0.22	0.02	0.00	0.01	0.00
Subtransmission Line Inspection	0.03	0.21	0.02	0.00	0.01	0.00
Substation Site Visit	0.03	0.21	0.02	0.00	0.01	0.00
Total	0.08	0.64	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Annual Greenhouse Gas Emissions

Vehicle	CO2 (MT/yr) ^a	CH4 (MT/yr) ^a	CO2e (MT/yr) ^b
Transmission Line Inspection	0.0	0.0	0.0
Subtransmission Line Inspection	0.0	0.0	0.0
Substation Site Visit	1.5	0.0	1.5
Total	1.5	0.0	1.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 52
Operational Emissions

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Transmission Line Inspection	1	Paved	60	0.001	0.000	0.05	0.00
Transmission Line Inspection	1	Unpaved	5	1.012	0.101	5.06	0.51
Subtransmission Line Inspection	1	Paved	62	0.001	0.000	0.05	0.00
Substation Site Visit	1	Paved	60	0.001	0.000	0.05	0.00
Total						5.20	0.51

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

SF6 Leakage Greenhouse Gas Emissions

Item	Value	Units
SF6 in 500 kV Equipment	11,515	pounds
SF6 in 115 kV Equipment	1,257	pounds
Total SF6 Added	12,772	pounds
SF6 Leakage Rate	0.5	%/year
SF6 Emissions	63.86	pounds
SF6 Global Warming Potential ^a	22,800	
CO2e Emissions^b	660	MT/yr

^a Based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0,

April 2008.

http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

^b CO₂e emissions [metric tons] = SF₆ emissions [lb] x

Global warming potential [lb CO₂e/lb SF₆] x 453.6 [g/lb] /

1,000,000 [g/MT]

Substation	Item	SF6 Volume (Pounds Each)	Quantity Added	Total SF6 Volume (Pounds)
500 kV				
Alberhill	Circuit Breaker	1,645	7	11,515
500 kV Total				11,515
115 kV				
Alberhill	Circuit Breaker	83	15	1,245
Valley	Circuit Breaker	71	(1)	(71)
Newcomb	Circuit Breaker	83	1	83
115 kV Total				1,257
Total Change				12,772

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin	SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	Aerial Lifts	Aerial Lifts0000	0.0101	0.0528	0.0831	0.0001	0.0025	8.7	0.0009
	25	Aerial Lifts	Aerial Lifts0016	0.0132	0.0451	0.0838	0.0001	0.0032	11.0	0.0012
	50	Aerial Lifts	Aerial Lifts0026	0.0168	0.1351	0.1218	0.0003	0.0035	19.6	0.0015
	120	Aerial Lifts	Aerial Lifts0051	0.0176	0.2265	0.1496	0.0004	0.0063	38.1	0.0016
	500	Aerial Lifts	Aerial Lifts0121	0.0580	0.3710	0.3660	0.0021	0.0109	213	0.0052
	750	Aerial Lifts	Aerial Lifts0501	0.1054	0.6706	0.6753	0.0039	0.0199	385	0.0095
Aerial Lifts Composite		Aerial Lifts	Aerial Lifts0751	0.0184	0.1646	0.1366	0.0004	0.0048	34.7	0.0017
Air Compressors	15	Air Compressors	Air Compressors0000	0.0087	0.0444	0.0545	0.0001	0.0023	7.2	0.0008
	25	Air Compressors	Air Compressors0016	0.0181	0.0605	0.1121	0.0002	0.0045	14.4	0.0016
	50	Air Compressors	Air Compressors0026	0.0263	0.1911	0.1476	0.0003	0.0047	22.3	0.0024
	120	Air Compressors	Air Compressors0051	0.0289	0.3023	0.1928	0.0006	0.0088	47.0	0.0026
	175	Air Compressors	Air Compressors0121	0.0424	0.4998	0.2187	0.0010	0.0104	88.5	0.0038
	250	Air Compressors	Air Compressors0176	0.0514	0.2531	0.2553	0.0015	0.0078	131	0.0046
	500	Air Compressors	Air Compressors0251	0.0894	0.4292	0.4150	0.0023	0.0134	232	0.0081
	750	Air Compressors	Air Compressors0501	0.1385	0.6633	0.6545	0.0036	0.0210	358	0.0125
	1000	Air Compressors	Air Compressors0751	0.1999	0.9265	2.5439	0.0049	0.0483	486	0.0180
	Air Compressors Composite		Air Compressors	Air Compressors1001	0.0349	0.3027	0.2104	0.0007	0.0088	63.6
Bore/Drill Rigs	15	Bore/Drill Rigs	Bore/Drill Rigs0000	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	25	Bore/Drill Rigs	Bore/Drill Rigs0016	0.0193	0.0658	0.1219	0.0002	0.0046	16.0	0.0017
	50	Bore/Drill Rigs	Bore/Drill Rigs0026	0.0190	0.2200	0.1662	0.0004	0.0009	31.0	0.0017
	120	Bore/Drill Rigs	Bore/Drill Rigs0051	0.0252	0.4660	0.1955	0.0009	0.0020	77.1	0.0023
	175	Bore/Drill Rigs	Bore/Drill Rigs0121	0.0324	0.7542	0.0787	0.0016	0.0030	141	0.0029
	250	Bore/Drill Rigs	Bore/Drill Rigs0176	0.0427	0.3426	0.0981	0.0021	0.0035	188	0.0039
	500	Bore/Drill Rigs	Bore/Drill Rigs0251	0.0706	0.6512	0.1622	0.0031	0.0058	311	0.0064
	750	Bore/Drill Rigs	Bore/Drill Rigs0501	0.1396	1.0891	0.3204	0.0062	0.0115	615	0.0126
	1000	Bore/Drill Rigs	Bore/Drill Rigs0751	0.2115	1.6437	3.8912	0.0093	0.0364	928	0.0191
Bore/Drill Rigs Composite		Bore/Drill Rigs	Bore/Drill Rigs1001	0.0428	0.5007	0.2864	0.0017	0.0042	165	0.0039
Cement and Mortar Mixers	15	Cement and Mortar Mixers	Cement and Mortar Mixers0000	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	Cement and Mortar Mixers	Cement and Mortar Mixers0016	0.0213	0.0724	0.1346	0.0002	0.0052	17.6	0.0019
Cement and Mortar Mixers Composite		Cement and Mortar Mixers	Cement and Mortar Mixers0026	0.0085	0.0414	0.0534	0.0001	0.0021	7.2	0.0008
Concrete/Industrial Saws	25	Concrete/Industrial Saws	Concrete/Industrial Saws0000	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018
	50	Concrete/Industrial Saws	Concrete/Industrial Saws0026	0.0279	0.2284	0.1910	0.0004	0.0053	30.2	0.0025
	120	Concrete/Industrial Saws	Concrete/Industrial Saws0051	0.0370	0.4561	0.2840	0.0009	0.0117	74.1	0.0033
	175	Concrete/Industrial Saws	Concrete/Industrial Saws0121	0.0623	0.8663	0.3523	0.0018	0.0160	160	0.0056
Concrete/Industrial Saws Composite		Concrete/Industrial Saws	Concrete/Industrial Saws0176	0.0337	0.3706	0.2471	0.0007	0.0093	58.5	0.0030
Cranes	50	Cranes	Cranes0000	0.0350	0.2256	0.1644	0.0003	0.0062	23.2	0.0032
	120	Cranes	Cranes0051	0.0376	0.3384	0.2298	0.0006	0.0120	50.1	0.0034
	175	Cranes	Cranes0121	0.0462	0.4744	0.2300	0.0009	0.0120	80.3	0.0042
	250	Cranes	Cranes0176	0.0544	0.2316	0.2705	0.0013	0.0094	112	0.0049
	500	Cranes	Cranes0251	0.0858	0.3535	0.3977	0.0018	0.0146	180	0.0077
	750	Cranes	Cranes0501	0.1446	0.5947	0.6821	0.0030	0.0248	303	0.0130
	9999	Cranes	Cranes0751	0.5219	1.9715	5.5760	0.0098	0.1146	971	0.0471
Cranes Composite		Cranes	Cranes1000	0.0681	0.3738	0.4223	0.0014	0.0143	129	0.0061
Crawler Tractors	50	Crawler Tractors	Crawler Tractors0000	0.0487	0.2566	0.1842	0.0003	0.0090	24.9	0.0044
	120	Crawler Tractors	Crawler Tractors0051	0.0609	0.4537	0.3562	0.0008	0.0221	65.8	0.0055
	175	Crawler Tractors	Crawler Tractors0121	0.0823	0.7265	0.4447	0.0014	0.0241	121	0.0074
	250	Crawler Tractors	Crawler Tractors0176	0.0924	0.3662	0.5348	0.0019	0.0192	166	0.0083
	500	Crawler Tractors	Crawler Tractors0251	0.1392	0.5877	0.7527	0.0025	0.0280	259	0.0126
	750	Crawler Tractors	Crawler Tractors0501	0.2506	1.0528	1.3878	0.0047	0.0510	465	0.0226
	1000	Crawler Tractors	Crawler Tractors0751	0.3749	1.5618	4.2168	0.0066	0.0656	658	0.0338
Crawler Tractors Composite		Crawler Tractors	Crawler Tractors1001	0.0789	0.5065	0.4482	0.0013	0.0227	114	0.0071

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin		SC								
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Crushing/Proc. Equipment	50	Crushing/Proc. Equipment	Crushing/Proc. Equipment000	0.0508	0.3859	0.2899	0.0006	0.0083	44.0	0.0046
	120	Crushing/Proc. Equipment	Crushing/Proc. Equipment0051	0.0506	0.5406	0.3289	0.0010	0.0140	83.1	0.0046
	175	Crushing/Proc. Equipment	Crushing/Proc. Equipment0121	0.0795	0.9556	0.3830	0.0019	0.0177	167	0.0072
	250	Crushing/Proc. Equipment	Crushing/Proc. Equipment0176	0.0967	0.4768	0.4357	0.0028	0.0134	245	0.0087
	500	Crushing/Proc. Equipment	Crushing/Proc. Equipment0251	0.1459	0.6977	0.6163	0.0037	0.0200	374	0.0132
	750	Crushing/Proc. Equipment	Crushing/Proc. Equipment0501	0.2307	1.1003	0.9907	0.0059	0.0316	589	0.0208
	9999	Crushing/Proc. Equipment	Crushing/Proc. Equipment0751	0.6019	2.5014	6.6977	0.0131	0.1238	1,308	0.0543
Crushing/Proc. Equipment Composite		Crushing/Proc. Equipment	Crushing/Proc. Equipment10000	0.0693	0.6187	0.3763	0.0015	0.0146	132	0.0062
Dumpers/Tenders	25	Dumpers/Tenders	Dumpers/Tenders0000	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Dumpers/Tenders Composite		Dumpers/Tenders	Dumpers/Tenders0026	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Excavators	25	Excavators	Excavators0000	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018
	50	Excavators	Excavators0026	0.0297	0.2365	0.1616	0.0003	0.0035	25.0	0.0027
	120	Excavators	Excavators0051	0.0448	0.4942	0.2638	0.0009	0.0092	73.6	0.0040
	175	Excavators	Excavators0121	0.0518	0.6636	0.1982	0.0013	0.0091	112	0.0047
	250	Excavators	Excavators0176	0.0647	0.3210	0.2222	0.0018	0.0074	159	0.0058
	500	Excavators	Excavators0251	0.0946	0.4495	0.3091	0.0023	0.0107	234	0.0085
	750	Excavators	Excavators0501	0.1569	0.7451	0.5194	0.0039	0.0178	387	0.0142
Excavators Composite		Excavators	Excavators0056	0.0559	0.5086	0.2269	0.0013	0.0086	120	0.0050
Forklifts	50	Forklifts	Forklifts0000	0.0150	0.1361	0.0904	0.0002	0.0013	14.7	0.0014
	120	Forklifts	Forklifts0051	0.0168	0.2086	0.0997	0.0004	0.0023	31.2	0.0015
	175	Forklifts	Forklifts0121	0.0228	0.3310	0.0732	0.0006	0.0029	56.1	0.0021
	250	Forklifts	Forklifts0176	0.0289	0.1551	0.0746	0.0009	0.0027	77.1	0.0026
	500	Forklifts	Forklifts0251	0.0416	0.2123	0.1038	0.0011	0.0038	111	0.0038
Forklifts Composite		Forklifts	Forklifts0501	0.0236	0.2148	0.0860	0.0006	0.0025	54.4	0.0021
Generator Sets	15	Generator Sets	Generator Sets0000	0.0109	0.0627	0.0768	0.0002	0.0032	10.2	0.0010
	25	Generator Sets	Generator Sets0016	0.0216	0.0738	0.1368	0.0002	0.0055	17.6	0.0019
	50	Generator Sets	Generator Sets0026	0.0242	0.2034	0.1881	0.0004	0.0051	30.6	0.0022
	120	Generator Sets	Generator Sets0051	0.0340	0.4585	0.3022	0.0009	0.0122	77.9	0.0031
	175	Generator Sets	Generator Sets0121	0.0469	0.7328	0.3291	0.0016	0.0136	142	0.0042
	250	Generator Sets	Generator Sets0176	0.0558	0.3746	0.3885	0.0024	0.0108	213	0.0050
	500	Generator Sets	Generator Sets0251	0.0862	0.5820	0.5697	0.0033	0.0167	337	0.0078
	750	Generator Sets	Generator Sets0501	0.1401	0.9395	0.9382	0.0055	0.0272	544	0.0126
	9999	Generator Sets	Generator Sets0751	0.3235	1.8648	5.2188	0.0105	0.0888	1,049	0.0292
Generator Sets Composite		Generator Sets	Generator Sets10000	0.0288	0.2667	0.2329	0.0007	0.0081	61.0	0.0026
Graders	50	Graders	Graders0000	0.0382	0.2599	0.1877	0.0004	0.0063	27.5	0.0034
	120	Graders	Graders0051	0.0521	0.5009	0.3219	0.0009	0.0153	75.0	0.0047
	175	Graders	Graders0121	0.0652	0.7261	0.3117	0.0014	0.0157	124	0.0059
	250	Graders	Graders0176	0.0781	0.3549	0.3652	0.0019	0.0129	172	0.0071
	500	Graders	Graders0251	0.1023	0.4610	0.4468	0.0023	0.0165	229	0.0092
	750	Graders	Graders0501	0.2167	0.9755	0.9628	0.0049	0.0353	486	0.0196
Graders Composite		Graders	Graders0751	0.0676	0.5696	0.3314	0.0015	0.0147	133	0.0061
Off-Highway Tractors	120	Off-Highway Tractors	Off-Highway Tractors0000	0.1108	0.6619	0.6362	0.0011	0.0455	93.7	0.0100
	175	Off-Highway Tractors	Off-Highway Tractors0121	0.1110	0.7932	0.6639	0.0015	0.0370	130	0.0100
	250	Off-Highway Tractors	Off-Highway Tractors0176	0.0890	0.3179	0.5983	0.0015	0.0227	130	0.0090
	750	Off-Highway Tractors	Off-Highway Tractors0251	0.3692	1.5358	2.4157	0.0057	0.0818	568	0.0333
	1000	Off-Highway Tractors	Off-Highway Tractors0751	0.5623	2.3619	6.0896	0.0082	0.1577	814	0.0507
Off-Highway Tractors Composite		Off-Highway Tractors	Off-Highway Tractors1001	0.1134	0.6101	0.7291	0.0017	0.0331	151	0.0102
Off-Highway Trucks	175	Off-Highway Trucks	Off-Highway Trucks0000	0.0622	0.7536	0.2376	0.0014	0.0112	125	0.0056
	250	Off-Highway Trucks	Off-Highway Trucks0176	0.0730	0.3435	0.2521	0.0019	0.0085	167	0.0066
	500	Off-Highway Trucks	Off-Highway Trucks0251	0.1183	0.5319	0.3878	0.0027	0.0135	272	0.0107
	750	Off-Highway Trucks	Off-Highway Trucks0501	0.1921	0.8627	0.6384	0.0044	0.0221	442	0.0173
	1000	Off-Highway Trucks	Off-Highway Trucks0751	0.2823	1.2403	3.1782	0.0063	0.0546	625	0.0255
Off-Highway Trucks Composite		Off-Highway Trucks	Off-Highway Trucks1001	0.1140	0.5385	0.4769	0.0027	0.0142	260	0.0103

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025				(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Air Basin	SC			COG	CO	NOX	SOX	PM	CO2	CH4
Equipment	MaxHP									
Other Construction Equipment	15	Other Construction Equipment	Other Construction Equipment000	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
	25	Other Construction Equipment	Other Construction Equipment0016	0.0159	0.0544	0.1008	0.0002	0.0038	13.2	0.0014
	50	Other Construction Equipment	Other Construction Equipment0026	0.0244	0.2188	0.1893	0.0004	0.0034	28.0	0.0022
	120	Other Construction Equipment	Other Construction Equipment0051	0.0379	0.5045	0.2730	0.0009	0.0087	80.9	0.0034
	175	Other Construction Equipment	Other Construction Equipment0121	0.0384	0.5858	0.1729	0.0012	0.0075	107	0.0035
500	Other Construction Equipment	Other Construction Equipment0176	0.0792	0.4606	0.3034	0.0025	0.0099	254	0.0071	
Other Construction Equipment Composite		Other Construction Equipment	Other Construction Equipment0501	0.0442	0.3474	0.2021	0.0013	0.0069	123	0.0040
Other General Industrial Equipmen	15	Other General Industrial Equipmen	Other General Industrial Equipmen0000	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
	25	Other General Industrial Equipmen	Other General Industrial Equipmen0016	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017
	50	Other General Industrial Equipmen	Other General Industrial Equipmen0026	0.0298	0.2099	0.1491	0.0003	0.0047	21.7	0.0027
	120	Other General Industrial Equipmen	Other General Industrial Equipmen0051	0.0436	0.4189	0.2803	0.0007	0.0120	62.0	0.0039
	175	Other General Industrial Equipmen	Other General Industrial Equipmen0121	0.0519	0.5684	0.2412	0.0011	0.0115	95.9	0.0047
	250	Other General Industrial Equipmen	Other General Industrial Equipmen0176	0.0608	0.2743	0.2679	0.0015	0.0083	136	0.0055
	500	Other General Industrial Equipmen	Other General Industrial Equipmen0251	0.1174	0.5103	0.4826	0.0026	0.0157	265	0.0106
	750	Other General Industrial Equipmen	Other General Industrial Equipmen0501	0.1939	0.8411	0.8117	0.0044	0.0262	437	0.0175
	1000	Other General Industrial Equipmen	Other General Industrial Equipmen0751	0.2627	1.1060	2.9924	0.0056	0.0579	560	0.0237
	Other General Industrial Equipmen Composite		Other General Industrial Equipmen	Other General Industrial Equipmen1001	0.0747	0.4438	0.3947	0.0016	0.0130	152
Other Material Handling Equipment	50	Other Material Handling Equipment	Other Material Handling Equipment0000	0.0410	0.2893	0.2073	0.0004	0.0065	30.3	0.0037
	120	Other Material Handling Equipment	Other Material Handling Equipment0051	0.0421	0.4076	0.2541	0.0007	0.0117	60.7	0.0038
	175	Other Material Handling Equipment	Other Material Handling Equipment0121	0.0653	0.7197	0.3067	0.0014	0.0146	122	0.0059
	250	Other Material Handling Equipment	Other Material Handling Equipment0176	0.0642	0.2920	0.2863	0.0016	0.0088	145	0.0058
	500	Other Material Handling Equipment	Other Material Handling Equipment0251	0.0837	0.3670	0.3482	0.0019	0.0113	192	0.0075
9999	Other Material Handling Equipment	Other Material Handling Equipment0501	0.3781	1.4596	3.9555	0.0073	0.0764	741	0.0341	
Other Material Handling Equipment Composite		Other Material Handling Equipment	Other Material Handling Equipment1000	0.0696	0.4355	0.3844	0.0015	0.0124	141	0.0063
Pavers	25	Pavers	Pavers0000	0.0225	0.0768	0.1422	0.0002	0.0053	18.7	0.0020
	50	Pavers	Pavers0026	0.0574	0.2803	0.2102	0.0004	0.0114	28.0	0.0052
	120	Pavers	Pavers0051	0.0662	0.4696	0.4003	0.0008	0.0263	68.2	0.0060
	175	Pavers	Pavers0121	0.0899	0.7543	0.5238	0.0014	0.0286	128	0.0081
	250	Pavers	Pavers0176	0.1097	0.4287	0.7020	0.0022	0.0254	194	0.0099
500	Pavers	Pavers0251	0.1263	0.5374	0.7572	0.0023	0.0284	233	0.0114	
Pavers Composite		Pavers	Pavers0501	0.0717	0.4745	0.3858	0.0009	0.0220	77.9	0.0065
Paving Equipment	25	Paving Equipment	Paving Equipment0000	0.0152	0.0520	0.0963	0.0002	0.0036	12.6	0.0014
	50	Paving Equipment	Paving Equipment0026	0.0468	0.2355	0.1789	0.0003	0.0095	23.9	0.0042
	120	Paving Equipment	Paving Equipment0051	0.0503	0.3671	0.3092	0.0006	0.0200	54.5	0.0045
	175	Paving Equipment	Paving Equipment0121	0.0687	0.5900	0.4021	0.0011	0.0219	101	0.0062
250	Paving Equipment	Paving Equipment0176	0.0672	0.2648	0.4289	0.0014	0.0154	122	0.0061	
Paving Equipment Composite		Paving Equipment	Paving Equipment0251	0.0548	0.3993	0.3281	0.0008	0.0190	68.9	0.0049
Plate Compactors	15	Plate Compactors	Plate Compactors0000	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Plate Compactors Composite		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Pressure Washers	15	Pressure Washers	Pressure Washers0000	0.0052	0.0301	0.0368	0.0001	0.0015	4.9	0.0005
	25	Pressure Washers	Pressure Washers0016	0.0087	0.0299	0.0555	0.0001	0.0022	7.1	0.0008
	50	Pressure Washers	Pressure Washers0026	0.0079	0.0810	0.0843	0.0002	0.0019	14.3	0.0007
	120	Pressure Washers	Pressure Washers0051	0.0082	0.1351	0.0897	0.0003	0.0031	24.1	0.0007
Pressure Washers Composite		Pressure Washers	Pressure Washers0121	0.0066	0.0531	0.0561	0.0001	0.0019	9.4	0.0006
Pumps	15	Pumps	Pumps0000	0.0089	0.0456	0.0560	0.0001	0.0024	7.4	0.0008
	25	Pumps	Pumps0016	0.0244	0.0816	0.1512	0.0002	0.0061	19.5	0.0022
	50	Pumps	Pumps0026	0.0299	0.2394	0.2138	0.0004	0.0061	34.3	0.0027
	120	Pumps	Pumps0051	0.0365	0.4656	0.3062	0.0009	0.0129	77.9	0.0033
	175	Pumps	Pumps0121	0.0499	0.7342	0.3301	0.0016	0.0142	140	0.0045
	250	Pumps	Pumps0176	0.0572	0.3604	0.3745	0.0023	0.0107	201	0.0052
	500	Pumps	Pumps0251	0.0959	0.6034	0.5922	0.0034	0.0178	345	0.0087
	750	Pumps	Pumps0501	0.1593	0.9975	0.9991	0.0057	0.0297	571	0.0144
	9999	Pumps	Pumps0751	0.4488	2.4388	6.8114	0.0136	0.1186	1,355	0.0405

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025											
Air Basin	SC			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
Equipment	MaxHP			COG	CO	NOX	SOX	PM	CO2	CH4	
Pumps Composite		Pumps	Pumps10000	0.0270	0.2617	0.2079	0.0006	0.0078	49.6	0.0024	
Rollers	15	Rollers	Rollers0000	0.0074	0.386	0.0461	0.0001	0.0018	6.3	0.0007	
	25	Rollers	Rollers0016	0.0161	0.0549	0.1017	0.0002	0.0038	13.3	0.0015	
	50	Rollers	Rollers0026	0.0345	0.2258	0.1776	0.0003	0.0068	26.0	0.0031	
	120	Rollers	Rollers0051	0.0392	0.3801	0.2847	0.0007	0.0137	59.0	0.0035	
	175	Rollers	Rollers0121	0.0553	0.6096	0.3030	0.0012	0.0156	108	0.0050	
	250	Rollers	Rollers0176	0.0656	0.3037	0.3629	0.0017	0.0127	153	0.0059	
Rollers Composite	500	Rollers	Rollers0251	0.0920	0.4189	0.4752	0.0022	0.0174	219	0.0083	
		Rollers	Rollers0501	0.0410	0.3763	0.2501	0.0008	0.0122	67.0	0.0037	
Rough Terrain Forklifts	50	Rough Terrain Forklifts	Rough Terrain Forklifts0000	0.0381	0.3041	0.2193	0.0004	0.0054	33.9	0.0034	
	120	Rough Terrain Forklifts	Rough Terrain Forklifts0051	0.0369	0.4106	0.2316	0.0007	0.0087	62.4	0.0033	
	175	Rough Terrain Forklifts	Rough Terrain Forklifts0121	0.0569	0.7229	0.2450	0.0014	0.0112	125	0.0051	
	250	Rough Terrain Forklifts	Rough Terrain Forklifts0176	0.0671	0.3372	0.2625	0.0019	0.0084	171	0.0061	
	Rough Terrain Forklifts Composite	500	Rough Terrain Forklifts	Rough Terrain Forklifts0251	0.0999	0.4838	0.3682	0.0025	0.0123	257	0.0090
			Rough Terrain Forklifts	Rough Terrain Forklifts0501	0.0396	0.4430	0.2336	0.0008	0.0090	70.3	0.0036
Rubber Tired Dozers	175	Rubber Tired Dozers	Rubber Tired Dozers0000	0.1163	0.8019	0.6895	0.0015	0.0386	129	0.0105	
	250	Rubber Tired Dozers	Rubber Tired Dozers0176	0.1329	0.4624	0.8841	0.0021	0.0340	183	0.0120	
	500	Rubber Tired Dozers	Rubber Tired Dozers0251	0.1817	0.7490	1.1543	0.0026	0.0448	265	0.0164	
	750	Rubber Tired Dozers	Rubber Tired Dozers0501	0.2747	1.1262	1.7818	0.0040	0.0684	399	0.0248	
	Rubber Tired Dozers Composite	1000	Rubber Tired Dozers	Rubber Tired Dozers0751	0.4321	1.7954	4.5523	0.0060	0.1202	592	0.0390
			Rubber Tired Dozers	Rubber Tired Dozers1001	0.1672	0.6620	1.0824	0.0025	0.0419	239	0.0151
Rubber Tired Loaders	25	Rubber Tired Loaders	Rubber Tired Loaders0000	0.0204	0.0697	0.1291	0.0002	0.0048	16.9	0.0018	
	50	Rubber Tired Loaders	Rubber Tired Loaders0026	0.0418	0.2904	0.2109	0.0004	0.0069	31.1	0.0038	
	120	Rubber Tired Loaders	Rubber Tired Loaders0051	0.0397	0.3916	0.2476	0.0007	0.0115	58.9	0.0036	
	175	Rubber Tired Loaders	Rubber Tired Loaders0121	0.0546	0.6199	0.2592	0.0012	0.0130	106	0.0049	
	250	Rubber Tired Loaders	Rubber Tired Loaders0176	0.0661	0.3041	0.3040	0.0017	0.0107	149	0.0060	
	500	Rubber Tired Loaders	Rubber Tired Loaders0251	0.1034	0.4654	0.4455	0.0023	0.0164	237	0.0093	
	750	Rubber Tired Loaders	Rubber Tired Loaders0501	0.2119	0.9532	0.9273	0.0049	0.0338	486	0.0191	
	Rubber Tired Loaders Composite	1000	Rubber Tired Loaders	Rubber Tired Loaders0751	0.2701	1.1927	3.2272	0.0060	0.0615	594	0.0244
			Rubber Tired Loaders	Rubber Tired Loaders1001	0.0559	0.4311	0.2835	0.0012	0.0121	109	0.0050
	Scrapers	120	Scrapers	Scrapers0000	0.0887	0.6472	0.5218	0.0011	0.0330	93.9	0.0080
175		Scrapers	Scrapers0121	0.1025	0.8864	0.5654	0.0017	0.0307	148	0.0092	
250		Scrapers	Scrapers0176	0.1187	0.4642	0.7040	0.0024	0.0254	209	0.0107	
500		Scrapers	Scrapers0251	0.1755	0.7332	0.9727	0.0032	0.0364	321	0.0158	
Scrapers Composite		750	Scrapers	Scrapers0501	0.3043	1.2657	1.7266	0.0056	0.0638	555	0.0275
			Scrapers	Scrapers0751	0.1495	0.7187	0.8387	0.0027	0.0335	262	0.0135
Signal Boards	15	Signal Boards	Signal Boards0000	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006	
	50	Signal Boards	Signal Boards0016	0.0332	0.2686	0.2268	0.0005	0.0063	36.2	0.0030	
	120	Signal Boards	Signal Boards0051	0.0394	0.4898	0.3076	0.0009	0.0127	80.2	0.0036	
	175	Signal Boards	Signal Boards0121	0.0587	0.8292	0.3433	0.0017	0.0152	155	0.0053	
	250	Signal Boards	Signal Boards0176	0.0794	0.4676	0.4435	0.0029	0.0132	255	0.0072	
Signal Boards Composite		Signal Boards	Signal Boards0251	0.1111	0.9909	0.0718	0.0002	0.0029	16.7	0.0010	
Skid Steer Loaders	25	Skid Steer Loaders	Skid Steer Loaders0000	0.0167	0.0568	0.1055	0.0002	0.0040	13.8	0.0015	
	50	Skid Steer Loaders	Skid Steer Loaders0026	0.0194	0.1977	0.1446	0.0003	0.0015	25.5	0.0017	
	120	Skid Steer Loaders	Skid Steer Loaders0051	0.0175	0.2665	0.1240	0.0005	0.0022	42.8	0.0016	
Skid Steer Loaders Composite		Skid Steer Loaders	Skid Steer Loaders0121	0.0186	0.2104	0.1354	0.0004	0.0019	30.3	0.0017	
Surfacing Equipment	50	Surfacing Equipment	Surfacing Equipment0000	0.0171	0.1105	0.0934	0.0002	0.0035	14.1	0.0015	
	120	Surfacing Equipment	Surfacing Equipment0051	0.0385	0.3950	0.2869	0.0007	0.0146	63.8	0.0035	
	175	Surfacing Equipment	Surfacing Equipment0121	0.0386	0.4642	0.2429	0.0010	0.0119	85.8	0.0035	
	250	Surfacing Equipment	Surfacing Equipment0176	0.0504	0.2804	0.3275	0.0015	0.0111	135	0.0045	
	500	Surfacing Equipment	Surfacing Equipment0251	0.0800	0.4236	0.4893	0.0022	0.0174	221	0.0072	
	750	Surfacing Equipment	Surfacing Equipment0501	0.1260	0.6643	0.7833	0.0035	0.0275	347	0.0114	
Surfacing Equipment Composite		Surfacing Equipment	Surfacing Equipment0751	0.0638	0.3590	0.3924	0.0017	0.0142	166	0.0058	

Table 53
SCAB Fleet Average Emission Factors (Diesel)

		2025								
Air Basin		SC								
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				ROG	CO	NOx	SOx	PM	CO2	CH4
Sweepers/Scrubbers	15	Sweepers/Scrubbers	Sweepers/Scrubbers000	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011
	25	Sweepers/Scrubbers	Sweepers/Scrubbers0016	0.0237	0.0808	0.1495	0.0002	0.0056	19.6	0.0021
	50	Sweepers/Scrubbers	Sweepers/Scrubbers0026	0.0308	0.2762	0.1942	0.0004	0.0033	31.6	0.0028
	120	Sweepers/Scrubbers	Sweepers/Scrubbers0051	0.0395	0.4895	0.2530	0.0009	0.0068	75.0	0.0036
	175	Sweepers/Scrubbers	Sweepers/Scrubbers0121	0.0565	0.8005	0.2201	0.0016	0.0084	139	0.0051
250	Sweepers/Scrubbers	Sweepers/Scrubbers0176	0.0587	0.3179	0.1898	0.0018	0.0062	162	0.0053	
Sweepers/Scrubbers Composite			Sweepers/Scrubbers	0.0410	0.4840	0.2255	0.0009	0.0061	78.5	0.0037
Tractors/Loaders/Backhoes	25	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0000	0.0191	0.0653	0.1209	0.0002	0.0045	15.9	0.0017
	50	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0026	0.0316	0.2678	0.1895	0.0004	0.0037	30.3	0.0029
	120	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0051	0.0281	0.3379	0.1761	0.0006	0.0055	51.7	0.0025
	175	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0121	0.0420	0.5839	0.1613	0.0011	0.0072	101	0.0038
	250	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0176	0.0633	0.3389	0.2157	0.0019	0.0073	172	0.0057
	500	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0251	0.1263	0.6506	0.4127	0.0039	0.0144	345	0.0114
	750	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0501	0.1896	0.9760	0.6256	0.0058	0.0216	517	0.0171
Tractors/Loaders/Backhoes Composite			Tractors/Loaders/Backhoes	0.0336	0.3586	0.1857	0.0008	0.0059	66.8	0.0030
Trenchers	15	Trenchers	Trenchers0000	0.0099	0.0517	0.0617	0.0001	0.0024	8.5	0.0009
	25	Trenchers	Trenchers0016	0.0397	0.1355	0.2509	0.0004	0.0094	32.9	0.0036
	50	Trenchers	Trenchers0026	0.0687	0.3197	0.2467	0.0004	0.0140	32.9	0.0062
	120	Trenchers	Trenchers0051	0.0625	0.4341	0.3863	0.0008	0.0259	64.9	0.0056
	175	Trenchers	Trenchers0121	0.1009	0.8327	0.6152	0.0016	0.0338	144	0.0091
	250	Trenchers	Trenchers0176	0.1247	0.4925	0.8480	0.0025	0.0309	223	0.0112
	500	Trenchers	Trenchers0251	0.1661	0.7370	1.0663	0.0031	0.0400	311	0.0150
750	Trenchers	Trenchers0501	0.3147	1.3882	2.0666	0.0059	0.0766	587	0.0284	
Trenchers Composite			Trenchers	0.0674	0.4085	0.3481	0.0007	0.0215	58.7	0.0061
Welders	15	Welders	Welders0000	0.0075	0.0381	0.0468	0.0001	0.0020	6.2	0.0007
	25	Welders	Welders0016	0.0141	0.0473	0.0876	0.0001	0.0035	11.3	0.0013
	50	Welders	Welders0026	0.0280	0.2077	0.1684	0.0003	0.0053	26.0	0.0025
	120	Welders	Welders0051	0.0223	0.2476	0.1601	0.0005	0.0073	39.5	0.0020
	175	Welders	Welders0121	0.0430	0.5400	0.2396	0.0011	0.0111	98.2	0.0039
	250	Welders	Welders0176	0.0423	0.2236	0.2294	0.0013	0.0069	119	0.0038
500	Welders	Welders0251	0.0585	0.3040	0.2969	0.0016	0.0095	168	0.0053	
Welders Composite			Welders	0.0214	0.1745	0.1373	0.0003	0.0052	25.6	0.0019

Source: File off-road-mobile-source-emission-factors-scenario-years-2007-2025).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>

Table 54
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories: **Passenger Vehicles & Delivery Trucks.**

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: 2025			
All model years in the range 1981 to 2025			
Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00342738	CO	0.00595363
NOx	0.00028846	NOx	0.00615945
ROG	0.00043545	ROG	0.00092178
SOx	0.00001070	SOx	0.00002761
PM10	0.00009679	PM10	0.00028425
PM2.5	0.00006418	PM2.5	0.00020958
CO2	1.11078571	CO2	2.88143570
CH4	0.00003641	CH4	0.00003765

Source: File on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/>

Table 55
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: 2025			
All model years in the range 1981 to 2025			
HHDT-DSL (pounds/mile)	HHDT-DSL, Exh (pounds/mile)		
CO	0.00431086	PM10	0.00034397
NOx	0.00932573	PM2.5	0.00031664
ROG	0.00080206		
SOx	0.00004018		
PM10	0.00048541		
PM2.5	0.00036326		
CO2	4.19512979		
CH4	0.00003697		

Source: File heavy-heavy-duty-on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from [http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-\(v2-3\)-emission-factors-\(on-road\)](http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-(v2-3)-emission-factors-(on-road))

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
1/2-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1/2-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
1-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
10-cu. yd. Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
10-cu. yd. Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
1-Ton Crew Cab Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
1-Ton Crew Cab, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
1-Ton Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
3/4-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
3/4-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
40' Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
40' Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Asphalt Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Asphalt Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Carry-all Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Carry-all Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Concrete Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Crew Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
Crew Vehicle	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Vehicle	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
Crewcab Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crewcab Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
Crushed Rock Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crushed Rock Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Dump Truck (Trash)	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck (Trash)	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Extendable Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Extendable Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Flat Bed Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flat Bed Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Flatbed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flatbed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Fuel, Helicopter Support Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Fuel, Helicopter Support Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Jet A Fuel Truck	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Jet A Fuel Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Low Bed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Low Bed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Lowboy Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Lowboy Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Maintenance Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
Maintenance Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	0%	1.69E+00	1.69E-01
Pipe Truck/Trailer	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Pipe Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Reel Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Reel Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	0%	1.69E+00	1.69E-01
Stake Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stake Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Stakebed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stakebed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Truck, Semi Tractor	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Truck, Semi Tractor	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Van	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Van	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Water Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Water Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Wire Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Wire Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Worker Commute	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Worker Commute	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01

^a Paved road silt loading from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997) for collector roads,

<http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf>

Unpaved road silt content from SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden

^b Average paved on-road vehicle weight in Riverside County from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

Unpaved worker commuting weight on access road assumed to be same as paved road weight

Unpaved weight for other trucks is based on upper limit of 33,000 lbs for medium heavy-duty trucks.

^c Equations:

$EF(\text{paved}) = k_p (sL/2)^{0.65} (W/3)^{1.5} - C$

Ref: AP-42, Section 13.2.1, "Paved Rods," November 2006

$EF(\text{unpaved}) = k_u (s/12)^a (W/3)^b$

Ref: AP-42, Section 13.2.2, "Unpaved Rods," November 2006

Constants:

$k_p =$	0.016	(Particle size multiplier for PM10)
	0.0024	(Particle size multiplier for PM2.5)
$C =$	0.00047	(Exhaust, brake wear and tire wear adjustment, PM10)
	0.00036	(Exhaust, brake wear and tire wear adjustment, PM2.5)
$k_u =$	1.5	(Particle size multiplier for PM)
	0.15	(Particle size multiplier for PM2.5)
$a =$	0.9	for PM10
	0.9	for PM2.5
$b =$	0.45	for PM10
	0.45	for PM2.5

^d Control efficiency from watering unpaved roads twice per day, from Table XI-D, Mitigation Measure Examples, Fugitive Dust from Unpaved Roads, http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html

^e Controlled emission factor [lb/mi] = Uncontrolled emission factor [lb/mi] x (1 - Control efficiency [%] / 100)

Table 57
Fugitive Dust Emission Factors
Soil Dropping During Excavation

Emission Factor [lb/cu. yd] = 0.0011 x (mean wind speed [mi/hr] / 5)^{1.3} / (moisture [%] / 2)^{1.4} x (number drops per ton) x (density [ton/cu. yd])
 Reference: AP-42, Equation (1), Section 13.2.4, November 2006

Parameter	Value	Basis
Mean Wind Speed	12	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G, default
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil
Number Drops	4	Assumption
Soil Density	1.215	Table 2.46, Handbook of Solid Waste Management

PM10 Emission Factor (Uncontrolled) 9.94E-04 lb/cu. yd
 Reduction from Watering Twice/Day^b 0%
 Controlled PM10 Emission Factor 9.94E-04 lb/cu. yd
 Controlled PM2.5 Emission Factor^a 2.07E-04 lb/cu. yd

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per cubic yard] x Volume soil handled [cubic yards per day]

Table 57
Fugitive Dust Emission Factors
Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
 Reference: SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-E

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Pct. time wind > 12 mph	100	Worst-case assumption

PM10 Emission Factor (Uncontrolled) 44.0 lb/day-acre
 Reduction from Watering Twice/Day 0%
 Controlled PM10 Emission Factor 44.0 lb/day-acre
 Controlled PM2.5 Emission Factor^a 9.2 lb/day-acre

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per acre-day] x Storage pile surface area [acres]

Table 57
Fugitive Dust Emission Factors
Bulldozing, Scraping and Grading

Emission Factor [lb/hr] = 0.75 x (silt content [%])^{1.5} / (moisture)^{1.4}
 Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil

PM10 Emission Factor (Uncontrolled) 0.348 lb/hr
 Reduction from Watering Twice/Day 0%
 Controlled PM10 Emission Factor 0.348 lb/hr
 Controlled PM2.5 Emission Factor^a 0.072 lb/hr

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing, scraping or grading time [hours/day]

SOIL IMPORT OPTION 1 WITH PROJECT COMMITMENT J

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Construction Emissions

The following emissions were calculated for construction activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:
 - a. Daily emissions were calculated for each construction phase for each Proposed Project Component.

These calculations are in Table 7 through Table 50.

Total daily emissions, including both on-site and off-site sources, are summarized by construction phase in Table 1.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

PM10 and PM2.5 emission factors for earth moving and soil handling were calculated from AP-42 sections and from the SCAQMD CEQA Handbook.

These emission factors are in Table 57.
 - b. The construction phases for each Proposed Project component that could overlap were identified, and daily emissions from overlapping phases were added together. The highest emissions that could occur on a single day during construction of each Proposed Project component were then identified. These emissions are summarized in Table 2.
 - c. Since construction of all of the Proposed Project components could occur at the same time, the maximum daily emissions during construction of the components were added together to estimate peak daily construction emissions. However, since substation site demolition and water line relocation activities would be completed prior to the start of any other construction, they were not included in the peak daily emissions calculation. The peak daily construction emissions are in Table 2.
2. Maximum daily on-site emissions during construction of each Proposed Project component for use in a Localized Significance Threshold (LST) analysis using the look-up table in Appendix C to the SCAQMD's Localized Significance Methodology. The following steps were used to calculate these emissions and to conduct the LST analysis.
 - a. Daily on-site emissions were calculated for each construction phase for each Proposed Project Component. On-site emissions for substation construction were defined as emissions that would occur on the substation site. On-site emissions for 500 kV transmission line and 115 kV subtransmission line construction were defined as emissions that would occur at a single 500 kV lattice tower or a 115 kV pole

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location.

These calculations are in Table 9 through Table 50.

On-site daily emissions by construction phase are summarized in Table 3.

The same emission factors used to calculate total daily emission were used to calculate on-site daily emissions.

- b. Since multiple construction phases could occur at the same time at the substation site, daily on-site emissions from overlapping phases were added together to identify maximum on-site daily emissions during substation construction. Maximum daily on-site emissions during telecommunications construction were added to the maximum daily emissions during substation construction, since telecommunications construction will occur at the substation site. Maximum daily on-site emissions Table 4.
- c. Since only one construction phase could occur at a 500 kV transmission line tower location or 115 kV subtransmission line pole location, emissions from overlapping phases were not added together to calculate maximum daily on-site emissions. Maximum daily on-site emissions during 500 kV transmission line and 115 kV subtransmission line construction are in Table 4.
- d. Distances to the closest receptors were determined for the LST analysis. For the substation site, the distance to the closest commercial receptor was used for analyses for CO and NO₂, since the air quality thresholds are for short-term averaging periods. The distance to the closest residential receptor was used for the PM₁₀ and PM_{2.5} analyses, since the air quality thresholds are for 24-hour averaging periods, and an individual would probably not be located at a commercial location for 24 hours.
The closest receptor to a 500 kV transmission tower location is a residence.
A distance of 25 meters was assumed for the receptor distance for the analysis for 115 kV subtransmission line construction.
- e. The look-up table values for the Lake Elsinore source/receptor area were used for the LST analyses.
- f. The maximum construction area in the look-up tables of 5 acres was used for the LST analysis for the substation site, and the minimum area of 1 acre was used for the 500 kV transmission line tower and 115 kV subtransmission line pole analyses.
- g. The maximum allowable daily on-site emissions for the analyses for the substation and 500 kV transmission line towers were calculated using linear interpolation with receptor distance of the emissions in the look-up tables to calculate allowable emissions for the actual receptor distances. Interpolation was not used for the LST analyses for the 115 kV subtransmission line analyses, since the receptor distance was assumed to be 25 meters. The LST analyses are in Table 5.

3. Total greenhouse gas (GHG) emissions during construction. The following steps were used to calculate these emissions:

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- a. Total GHG emissions were calculated for each construction phase for Each Proposed Project Component. These calculations are in Table 9 through Table 50. Total GHG emissions, including both on-site and off-site sources, are summarized by construction phase in Table 6.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

- b. Total GHG emissions during each construction phase were added together to calculate total GHG emissions during construction. These emissions are summarized in Table 6.

Operational Emissions

The following emissions were calculated for operational activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:

- a. Daily emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

- b. It was conservatively assumed that the transmission line inspections would both occur on the same day as a visit to the substation site, and daily emissions from these three activities were added together to peak daily operational emissions. These emissions are in Table 52.

2. Annual greenhouse gas (GHG) emissions during operation. The following steps were used to calculate these emissions:

- a. Annual emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

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The exhaust emission factors are in Table 53 through Table 55.

- b. Annual emissions from leakage of sulfur hexafluoride (SF6) from gas-insulated switch gear (GIS) were calculated by multiplying the total amount of SF6 in new GIS by the estimated annual leakage rate. The annual SF6 leakage rate was then multiplied by the SF6 global warming potential to calculate annual CO2-equivalent emissions from SF6 leakage. These calculations are in Table 52.
- c. Annual GHG emissions from the operational activities and from SF6 leakage were added together to calculate Annual operational GHG emissions. These emissions are summarized in Table 52.

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	3.42	23.90	30.16	0.12	13.35	2.22
Substation Site Water Line Relocation	0.65	6.60	2.80	0.01	18.26	1.92
Substation Construction						
Survey	0.11	0.86	0.07	0.00	5.78	0.57
Grading	8.99	55.86	53.28	0.21	139.29	18.40
Fencing	0.42	4.32	1.30	0.01	16.15	1.62
Civil	2.90	31.01	20.07	0.10	23.43	2.88
Control Building	0.17	1.32	0.20	0.00	14.80	1.47
Electrical	1.26	12.43	6.41	0.03	17.75	1.96
Wiring	0.28	2.25	0.63	0.01	11.58	1.16
Transformers	0.66	6.27	2.25	0.01	21.41	2.20
Maintenance Crew Equipment Check	0.12	0.94	0.19	0.00	15.42	1.54
Testing	0.11	0.87	0.07	0.00	8.56	0.85
Asphalting	2.41	11.86	12.23	0.05	24.21	2.77
Landscaping	1.72	11.07	15.40	0.07	20.80	2.43
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	9.32	0.93
Marshalling Yard	0.63	4.65	2.81	0.02	14.43	1.51
Roads and Landing Work	2.37	19.00	10.34	0.05	30.22	4.38
Install Helicopter Platforms	0.16	1.23	0.10	0.00	0.32	0.02
Tower Removal	1.02	6.57	4.56	0.02	47.74	4.91
Foundation Removal	0.61	6.89	2.73	0.01	22.42	2.33
Tower Foundations Installation	2.01	15.93	6.66	0.06	48.92	5.11
Install Micropile Foundations	0.16	1.23	0.10	0.00	0.32	0.02
Tower Steel Haul	0.31	3.62	0.90	0.01	25.12	2.53
Tower Steel Assembly	0.98	8.03	3.96	0.02	15.36	1.64
Tower Erection	1.46	8.84	6.22	0.03	38.06	3.98
Tower Erection (Helicopter) Ground Support	0.82	6.98	2.35	0.02	42.96	4.34
Tower Helicopter Operations	46.71	56.80	577.42	32.18	12.02	12.02
Wire Stringing	20.27	61.08	38.52	1.51	175.06	18.50
Restoration	1.08	8.31	4.75	0.03	23.20	2.75
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard	0.36	3.35	1.16	0.01	10.65	1.09
Roads and Landing Work	1.79	14.07	8.05	0.04	5.22	1.19
Guard Structure Installation	1.61	10.08	7.33	0.05	0.69	0.27
Remove Existing Wood H-Frames and Poles	1.07	7.58	4.97	0.02	0.60	0.20
Remove Existing Tubular Steel/Light Weight Steel Poles	0.98	5.99	4.23	0.02	0.69	0.18
Install Tubular Steel Pole Foundations	1.41	11.32	5.50	0.05	1.65	0.33
Steel Pole Haul	0.70	3.43	3.10	0.02	0.41	0.12
Steel Pole Assembly	0.98	5.99	4.23	0.02	0.69	0.18
Steel Pole Erection	0.98	5.99	4.23	0.02	0.69	0.18
Wire Stringing	5.07	29.37	24.43	0.15	2.08	0.80
Vault Installation	2.63	17.58	10.62	0.07	2.05	0.52
Duct Bank Installation	1.39	13.75	6.11	0.04	2.20	0.46
Install Underground Cable	3.51	19.09	13.63	0.09	1.50	0.50
Guard Structure Removal	1.50	9.66	7.71	0.04	0.69	0.29
Restoration	1.22	9.85	5.55	0.03	3.58	0.53
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation	0.27	2.81	1.45	0.01	0.30	0.07
Control Building	0.54	3.56	3.15	0.02	0.23	0.09
Overhead Communications Installation	0.60	3.97	3.18	0.02	0.33	0.10
Substation Telecommunications Equipment Installation	0.08	0.62	0.05	0.00	0.16	0.01
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	16.20	1.65
Additional Substation Construction						

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	1.16	12.41	6.30	0.03	5.48	0.73
Electrical	1.41	13.32	7.68	0.03	0.84	0.31
Wiring	0.44	3.97	1.56	0.01	0.59	0.09
Testing	0.11	0.83	0.07	0.00	0.22	0.02
Civil - Demo	0.58	5.75	3.19	0.02	5.46	0.63

Table 2
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Construction						
Survey	0.11	0.86	0.07	0.00	5.78	0.57
Grading	8.99	55.86	53.28	0.21	139.29	18.40
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	5.43	40.28	23.30	0.12	129.89	13.56
Civil	2.90	31.01	20.07	0.10	23.43	2.88
Landscaping	1.72	11.07	15.40	0.07	20.80	2.43
Maximum	8.99	55.86	53.28	0.21	139.29	18.40
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	9.32	0.93
Marshalling Yard, Road and Landing Work, Install Helicopter Platforms	3.15	24.89	13.25	0.07	44.97	5.91
Marshalling Yard, Tower Removal, Tower Foundations Installation, Install Micropile Foundations, Tower Steel Haul, Tower Steel Assembly, Tower Erection, Tower Erection (Helicopter) Ground Support, Tower Helicopter Operations	54.09	112.65	604.98	32.37	244.93	36.06
Marshalling Yard, Foundation Removal	1.24	11.55	5.54	0.03	36.85	3.84
Marshalling Yard, Wire Stringing	20.89	65.73	41.33	1.52	189.48	20.01
Restoration	1.08	8.31	4.75	0.03	23.20	2.75
Maximum	54.09	112.65	604.98	32.37	244.93	36.06
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard, Roads and Landing Work, Guard Structure Installation, Remove Existing Wood H-Frames and Poles, Remove Existing Tubular Steel/Light Weight Steel Poles, Install Tubular Steel Pole Foundations, Steel Pole Haul, Steel Pole Assembly, Steel Pole Erection, Wire Stringing, Guard Structure Removal, Vault Installation, Duct Bank Installation, Install Underground Cable	23.99	157.27	105.30	0.64	29.82	6.30
Restoration	1.22	9.85	5.55	0.03	3.58	0.53
Maximum	23.99	157.27	105.30	0.64	29.82	6.30
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation, Control Building, Overhead Communications Installation, Substation Telecommunications Equipment Installation	1.49	10.96	7.83	0.05	1.02	0.28
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	16.20	1.65
Maximum	1.49	10.96	7.83	0.05	16.20	1.65
Additional Substation Construction						
Civil, Electrical, Wiring, Testing, Civil - Demo	3.68	36.28	18.80	0.09	12.58	1.77
Maximum	3.68	36.28	18.80	0.09	12.58	1.77
PEAK DAILY^b	92.24	373.02	790.18	33.35	442.82	64.18

^a The construction phases within a group could all occur at the same time.

^b Peak daily emissions are the sum of the maximum daily emissions during construction of the substation, the 500 kV transmission lines, the 115 kV subtransmission lines, the telecommunications facilities, and additional substation construction.

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	10.05	1.33
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	17.89	1.89
Substation Construction						
Survey	0.00	0.03	0.00	0.00	5.57	0.56
Grading	7.77	48.63	41.91	0.15	137.21	17.92
Fencing	0.16	2.27	1.13	0.00	15.61	1.58
Civil	1.69	23.53	10.30	0.04	22.13	2.45
Control Building	0.01	0.09	0.09	0.00	14.48	1.45
Electrical	0.87	9.35	6.16	0.02	16.94	1.90
Wiring	0.08	0.61	0.49	0.00	11.14	1.13
Transformers	0.40	4.21	2.08	0.01	20.87	2.16
Maintenance Crew Equipment Check	0.02	0.12	0.12	0.00	15.21	1.52
Testing	0.01	0.05	0.00	0.00	8.35	0.84
Asphalting	1.52	6.44	4.79	0.01	22.67	2.44
Landscaping	0.30	2.81	1.80	0.00	18.41	1.87
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	14.08	1.47
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	10.43	1.08
Roads and Landing Work	1.60	12.73	7.50	0.04	4.88	1.15
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	1.16	0.25
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	0.71	0.36
Duct Bank Installation	0.71	8.86	3.54	0.02	0.89	0.30
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	3.10	0.48
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	15.98	1.64
Additional Substation Construction						

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	4.99	0.61
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	5.02	0.56

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	10.05	1.33
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	17.89	1.89
Substation and Telecommunications Construction						
Survey	0.00	0.03	0.00	0.00	5.57	0.56
Grading	7.77	48.63	41.91	0.15	137.21	17.92
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	3.05	23.14	14.86	0.04	125.28	13.02
Civil	1.69	23.53	10.30	0.04	22.13	2.45
Landscaping	0.30	2.81	1.80	0.00	18.41	1.87
Maximum Substation Construction	7.77	48.63	41.91	0.15	137.21	17.92
Maxim Substation plus Telecommunications	8.60	55.37	46.29	0.17	153.19	19.56
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	14.08	1.47
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
Maximum	5.93	32.28	29.00	0.15	14.08	2.33
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	10.43	1.08
Roads and Landing Work	1.60	12.73	7.50	0.04	4.88	1.15
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	1.16	0.25
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	0.71	0.36
Duct Bank Installation	0.71	8.86	3.54	0.02	0.89	0.30
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	3.10	0.48
Maximum	4.34	23.98	22.32	0.13	10.43	1.15
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	15.98	1.64
Maximum	0.83	6.74	4.38	0.02	15.98	1.64
Additional Substation Construction						

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	4.99	0.61
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	5.02	0.56
Maximum	1.15	11.27	7.51	0.02	5.02	0.61

^a The construction phases within a group could all occur at the same time at the same location.

The following 115 kV Subtransmission Line construction activity emissions were divided by the following number of locations:

- Roads and Landing Work: 6 structure pads per day
- Guard Structure Installation: 4 structures per day
- Remove Existing H-Frames and Poles: 15 poles per day
- Remove Existing Tubular Steel/Light Weight Steel Poles: 2 poles per day
- Steel Pole Assembly: 2 poles per day
- Steel Pole Erection: 2 poles per day
- Guard Structure Removal: 6 structures per day
- Restoration: 6 structure pads per day

Table 5
Construction Emissions
Localized Significance Threshold Analysis

Pollutant	Maximum Daily Onsite Emissions	Receptor Distance (m)	Allowable Emissions Interpolation ^a				Interpolated Emissions (lb/day) ^b	Allowable Exceeded?
			Distance 1 (m)	Emissions 1 (lb/day)	Distance 2 (m)	Emissions 2 (lb/day)		
Demolition^{c,d}								
CO	13	270	200	7,535	500	25,792	11,795	No
NOx	8	270	200	672	500	1,072	765	No
PM10	10	420	200	96	500	207	177	No
PM2.5	1	420	200	31	500	105	85	No
Water Line Relocation^{c,e}								
CO	5	270	200	4,850	500	21,040	8,628	No
NOx	3	270	200	460	500	896	562	No
PM10	18	420	200	67	500	178	148	No
PM2.5	2	420	200	20	500	86	68	No
Substation and Telecommunications Construction^c								
CO	55	270	200	7,535	500	25,792	11,795	No
NOx	46	270	200	672	500	1,072	765	No
PM10	153	420	200	96	500	207	177	No
PM2.5	20	420	200	31	500	105	85	No
500 kV Transmission Line Construction^f								
CO	32	93	50	974	100	1,918	1,786	No
NOx	29	93	50	203	100	292	280	No
PM10	14	93	50	12	100	30	27	No
PM2.5	2	93	50	4	100	8	7	No
115 kV Subtransmission Line Construction^g								
CO	24	25	25	661	25	661	661	No
NOx	22	25	25	162	25	162	162	No
PM10	10	25	25	13	25	13	13	No
PM2.5	1	25	25	3	25	3	3	No

^a Allowable emissions are from Appendix C to Final Localized Significance Methodology, SCAQMD, revised July 2008, downloaded from <http://www.aqmd.gov/ceqa/handbook/LST/LST.html>

^b Interpolated emissions = Emissions 1 + (Receptor distance - Distance 1) x (Emissions 2 - Emissions 1) / (Distance 2 - Distance 1)

^c CO and NOx receptor distances are closest commercial receptor; PM10 and PM2.5 are closest residential receptor. Allowable emissions are for a 5 acre site.

^d Allowable emissions are for a 5 acre site.

^e Allowable emissions are for a 1 acre site.

^f Closest receptor to a transmission tower base is a residence at approximately 93 meters. Allowable emissions are for a 1 acre site.

^g Allowable emissions for CO, NOx and PM2.5 are for a 1-acre site to represent construction at a pole location.

Maximum PM10 emissions occur at the marshalling yard, so allowable emissions are for a 5-acre site

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO ₂ e (MT)
Substation Site Demolition	283.31
Substation Site Water Line Relocation	11.84
Substation Construction	
Survey	1.89
Grading	557.62
Fencing	7.31
Civil	375.00
Control Building	4.02
Electrical	346.90
Wiring	71.94
Transformers	57.20
Maintenance Crew Equipment Check	8.83
Testing	25.71
Asphalting	66.81
Landscaping	144.94
500 kV Transmission Line Construction	
Survey	0.52
Marshalling Yard	87.79
Roads and Landing Work	53.15
Install Helicopter Platforms	32.89
Tower Removal	4.03
Foundation Removal	1.46
Tower Foundations Installation	63.63
Install Micropile Foundations	122.15
Tower Steel Haul	3.76
Tower Steel Assembly	38.82
Tower Erection	32.96
Tower Erection (Helicopter) Ground Support	6.40
Tower Helicopter Operations	1,626.43
Wire Stringing	18.53
Restoration	4.27
115 kV Subtransmission Line Construction	
Survey	2.54
Marshalling Yard	145.31
Roads and Landing Work	128.76
Guard Structure Installation	52.96
Remove Existing Wood H-Frames and Poles	24.84
Remove Existing Tubular Steel/Light Weight Steel Poles	4.98
Install Tubular Steel Pole Foundations	159.88
Steel Pole Haul	95.64
Steel Pole Assembly	254.01
Steel Pole Erection	254.01
Wire Stringing	541.72
Vault Installation	15.31
Duct Bank Installation	17.61
Install Underground Cable	94.21
Guard Structure Removal	29.04
Restoration	22.66
Telecommunications Construction	
Tower Foundation	3.69

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO₂e (MT)
Tower Construction	29.76
Dish Installation	2.99
Control Building	21.81
Overhead Communications Installation	28.92
Substation Telecommunications Equipment Installation	0.91
Santiago Peak Communication Site	18.85
Additional Substation Construction	
Civil	11.89
Electrical	24.70
Wiring	12.80
Testing	2.43
Civil - Demo	6.67
Total	6,069.00

**Table 7
Substation Site Demolition Emissions**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.39	12.69	7.61	0.02	0.39	0.36	47.9
Onsite Motor Vehicle Exhaust	0.01	0.04	0.09	0.00	0.00	0.00	1.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	9.65	0.97	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.39	12.73	7.70	0.02	10.05	1.33	48.9
Offsite Motor Vehicle Exhaust	2.03	11.17	22.45	0.10	1.19	0.89	234.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	2.11	0.00	
Offsite Total	2.03	11.17	22.45	0.10	3.30	0.89	234.4
Total	3.42	23.90	30.16	0.12	13.35	2.22	283.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Track Loader	148	2	50	8
Bobcat	75	1	50	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Track Loader	148	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Track Loader	1.32	11.62	7.11	0.02	0.39	0.35
Bobcat	0.07	1.07	0.50	0.00	0.01	0.01
Total	1.39	12.69	7.61	0.02	0.39	0.36

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Track Loader	44.0	0.0	44.0
Bobcat	3.9	0.0	3.9
Total	47.9	0.0	47.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	1	50	4	10
Offsite				
Dump Truck	40	50	N/A	60
Worker Commute	4	50	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 20,000 CY hauled offsite over 50 days and 10 CY/truck = 20,000 / 50 / 10 = 40

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 7
Substation Site Demolition Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.01	0.04	0.09	0.00	0.00	0.00
Offsite						
Dump Truck	1.92	10.35	22.38	0.10	1.16	0.87
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	2.03	11.17	22.45	0.10	1.19	0.89
Total	2.04	11.21	22.54	0.10	1.19	0.89

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	1.0	0.0	1.0
Onsite Total	1.0	0.0	1.0
Offsite			
Dump Truck	228.3	0.0	228.4
Worker Commute	6.0	0.0	6.1
Offsite Total	234.4	0.0	234.4
Total	235.3	0.0	235.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Onsite Total						9.65	0.97
Offsite							
Dump Truck	40	Paved	60	0.001	0.000	1.92	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						2.11	0.00
Total						11.77	0.97

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion ^d	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 8
Substation Site Water Line Relocation Emissions**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	5.08	2.56	0.01	0.10	0.10	7.4
Onsite Motor Vehicle Exhaust	0.01	0.09	0.12	0.00	0.01	0.01	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	17.63	1.76	
Earthwork Fugitive PM	--	--	--	--	0.15	0.03	
Onsite Total	0.47	5.16	2.68	0.01	17.89	1.89	7.6
Offsite Motor Vehicle Exhaust	0.18	1.44	0.12	0.00	0.04	0.03	4.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.18	1.44	0.12	0.00	0.38	0.03	4.2
Total	0.65	6.60	2.80	0.01	18.26	1.92	11.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	20	8
Crane	125	1	20	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.46	5.08	2.56	0.01	0.10	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	3.8	0.0	3.8
Crane	3.6	0.0	3.6
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	20	1	2.5
Stakebed Truck	2	20	2	5
Crew Vehicle	2	20	2	5
Offsite				
Worker Commute	7	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Stakebed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Highest (Most Conservative) EMFAC2007 (version 2.3) or Highest (Most Conservative) EMFAC2007 (version 2.3)

**Table 8
Substation Site Water Line Relocation Emissions**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.00	0.01	0.02	0.00	0.00	0.00
Stakebed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.12	0.00	0.01	0.01
Offsite						
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.18	1.44	0.12	0.00	0.04	0.03
Total	0.20	1.53	0.24	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.2	0.0	0.2
Offsite			
Worker Commute	4.2	0.0	4.2
Offsite Total	4.2	0.0	4.2
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Stakebed Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Crew Vehicle	2	Unpaved	5	0.556	0.056	5.56	0.56
Onsite Total						17.63	1.76
Offsite							
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						17.97	1.76

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	147	9.94E-04	2.07E-04	0.15	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.15	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Based on trench 4 ft. wide x 6 ft. deep x 1,700 ft. long over 20 days x 2 = 4 ft. x 6 ft. x 1,770 ft. / 27 cu. ft. per CY / 20 days = 151 CY/day 7

**Table 9
Substation Construction Emissions
Survey**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.03	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	5.56	0.56	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.03	0.00	0.00	5.57	0.56	0.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	1.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	1.8
Total	0.11	0.86	0.07	0.00	5.78	0.57	1.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Vehicle	2	15	2	5
Offsite				
Worker Commute	4	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 9
Substation Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.03	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.86	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	1.8	0.0	1.8
Offsite Total	1.8	0.0	1.8
Total	1.9	0.0	1.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Vehicle	2	Unpaved	5	0.556	0.056	5.56	0.56
Onsite Total						5.56	0.56
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						5.76	0.56

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 10
Substation Construction Emissions
Grading

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	7.68	48.05	41.39	0.15	1.61	1.48	393.3
Onsite Motor Vehicle Exhaust	0.09	0.59	0.52	0.00	0.04	0.03	9.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	109.10	10.91	
Earthwork Fugitive PM	--	--	--	--	26.46	5.50	
Onsite Total	7.77	48.63	41.91	0.15	137.21	17.92	402.4
Offsite Motor Vehicle Exhaust	1.22	7.23	11.36	0.05	0.64	0.47	155.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.44	0.00	
Offsite Total	1.22	7.23	11.36	0.05	2.08	0.47	155.2
Total	8.99	55.86	53.28	0.21	139.29	18.40	557.6

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Dozer	305	2	60	7
Loader	147	3	60	4
Scraper	267	3	60	7
Grader	110	1	60	7
4x4 Backhoe	79	2	60	7
4x4 Tamper	174	1	60	7
Excavator	152	1	60	7

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Dozer	305	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Loader	147	0.055	0.620	0.259	0.001	0.013	0.012	106.315	0.005	Rubber Tired Loaders
Scraper	267	0.176	0.733	0.973	0.003	0.036	0.034	321.428	0.016	Scrapers
Grader	110	0.052	0.501	0.322	0.001	0.015	0.014	74.965	0.005	Graders
4x4 Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
4x4 Tamper	174	0.038	0.586	0.173	0.001	0.007	0.007	106.516	0.003	Other Construction Equipment
Excavator	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Dozer	1.95	8.23	10.54	0.04	0.39	0.36
Loader	0.66	7.44	3.11	0.01	0.16	0.14
Scraper	3.69	15.40	20.43	0.07	0.77	0.70
Grader	0.36	3.51	2.25	0.01	0.11	0.10
4x4 Backhoe	0.39	4.73	2.47	0.01	0.08	0.07
4x4 Tamper	0.27	4.10	1.21	0.01	0.05	0.05
Excavator	0.36	4.64	1.39	0.01	0.06	0.06
Total	7.68	48.05	41.39	0.15	1.61	1.48

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Dozer	98.8	0.0	98.9
Loader	34.7	0.0	34.8
Scraper	183.7	0.0	183.9
Grader	14.3	0.0	14.3
4x4 Backhoe	19.7	0.0	19.7
4x4 Tamper	20.3	0.0	20.3
Excavator	21.4	0.0	21.4
Total	392.9	0.0	393.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 10
Substation Construction Emissions
Grading

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	3	60	7	17.5
Crew Vehicle	6	60	7	17.5
Offsite				
Dump Truck	20	60	N/A	60
Worker Commute	10	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.04	0.23	0.49	0.00	0.03	0.02
Crew Vehicle	0.05	0.36	0.03	0.00	0.01	0.01
Onsite Total	0.09	0.59	0.52	0.00	0.04	0.03
Offsite						
Dump Truck	0.96	5.17	11.19	0.05	0.58	0.44
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	1.22	7.23	11.36	0.05	0.64	0.47
Total	1.31	7.82	11.88	0.06	0.68	0.50

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	6.0	0.0	6.0
Crew Vehicle	3.2	0.0	3.2
Onsite Total	9.2	0.0	9.2
Offsite			
Dump Truck	137.0	0.0	137.0
Worker Commute	18.1	0.0	18.2
Offsite Total	155.1	0.0	155.2
Total	164.3	0.0	164.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	3	Unpaved	17.5	0.965	0.097	50.67	5.07
Crew Vehicle	6	Unpaved	17.5	0.556	0.056	58.43	5.84
Onsite Total						109.10	10.91
Offsite							
Dump Truck	20	Paved	60	0.001	0.000	0.96	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.44	0.00
Total						110.54	10.91

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 10
Substation Construction Emissions
Grading

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	3,078	9.94E-04	2.07E-04	3.06	0.64
Bulldozing, Scraping and Grading	hr/day	42	0.348	0.072	14.60	3.04
Storage Pile Wind Erosion ^d	acres	0.4	22.0	4.58	8.80	1.83
Total					26.46	5.50

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 114,700 CY plus 70,000 CY from borrow pit, total 184,700 CY over 60 days

^d Based on 1,000 CY in each of two cones 9 ft. tall x 100 ft. diameter

**Table 11
Substation Construction Emissions
Fencing**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	2.13	0.99	0.00	0.02	0.02	2.3
Onsite Motor Vehicle Exhaust	0.02	0.13	0.14	0.00	0.01	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	15.59	1.56	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.16	2.27	1.13	0.00	15.61	1.58	2.8
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	4.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	4.5
Total	0.42	4.32	1.30	0.01	16.15	1.62	7.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bobcat	75	1	15	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bobcat	0.14	2.13	0.99	0.00	0.02	0.02
Total	0.14	2.13	0.99	0.00	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bobcat	2.3	0.0	2.3
Total	2.3	0.0	2.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	15	3	7.5
Crewcab Truck	3	15	2	5
Offsite				
Worker Commute	10	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Crewcab Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

**Table 11
Substation Construction Emissions
Fencing**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.01	0.04	0.05	0.00	0.00	0.00
Crewcab Truck	0.01	0.09	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.13	0.14	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.19	0.31	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crewcab Truck	0.3	0.0	0.3
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	4.5	0.0	4.5
Offsite Total	4.5	0.0	4.5
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	7.5	0.965	0.097	7.24	0.72
Crewcab Truck	3	Unpaved	5	0.556	0.056	8.35	0.83
Onsite Total						15.59	1.56
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						16.07	1.56

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 12
Substation Construction Emissions
Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.68	23.43	10.09	0.04	0.26	0.24	155.6
Onsite Motor Vehicle Exhaust	0.02	0.10	0.21	0.00	0.01	0.01	3.9
Onsite Motor Vehicle Fugitive PM	--	--	--	--	21.72	2.17	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	1.69	23.53	10.30	0.04	22.13	2.45	159.4
Offsite Motor Vehicle Exhaust	1.21	7.48	9.77	0.05	0.58	0.43	215.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	1.21	7.48	9.77	0.05	1.30	0.43	215.6
Total	2.90	31.01	20.07	0.10	23.43	2.88	375.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	152	2	90	4
Foundation Auger	79	2	90	7
Backhoe	79	3	90	6
Skip Loader	75	2	90	3
Bobcat Skid Steer	75	2	90	4
Forklift	83	1	90	4
17-Ton Crane	125	1	90	2

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Foundation Auger	79	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Skip Loader	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts
17-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.41	5.31	1.59	0.01	0.07	0.07
Foundation Auger	0.35	6.52	2.74	0.01	0.03	0.03
Backhoe	0.51	6.08	3.17	0.01	0.10	0.09
Skip Loader	0.10	1.60	0.74	0.00	0.01	0.01
Bobcat Skid Steer	0.14	2.13	0.99	0.00	0.02	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
17-Ton Crane	0.09	0.95	0.46	0.00	0.02	0.02
Total	1.68	23.43	10.09	0.04	0.26	0.24

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	36.7	0.0	36.7
Foundation Auger	44.1	0.0	44.1
Backhoe	38.0	0.0	38.1
Skip Loader	10.5	0.0	10.5
Bobcat Skid Steer	26.2	0.0	26.3
Forklift	0.0	0.0	0.0
17-Ton Crane	0.0	0.0	0.0
Total	155.5	0.0	155.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 12
Substation Construction Emissions
Civil

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	90	2	5
Water Truck	1	90	5	12.5
Offsite				
Concrete Truck	17	90	N/A	60
Worker Commute	15	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Water Truck	0.01	0.05	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.10	0.21	0.00	0.01	0.01
Offsite						
Concrete Truck	0.82	4.40	9.51	0.04	0.50	0.37
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	1.21	7.48	9.77	0.05	0.58	0.43
Total	1.23	7.58	9.98	0.05	0.59	0.44

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	1.7	0.0	1.7
Water Truck	2.1	0.0	2.1
Onsite Total	3.9	0.0	3.9
Offsite			
Concrete Truck	174.7	0.0	174.7
Worker Commute	40.8	0.0	40.8
Offsite Total	215.5	0.0	215.6
Total	219.4	0.0	219.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Water Truck	1	Unpaved	12.5	0.965	0.097	12.06	1.21
Onsite Total						21.72	2.17
Offsite							
Concrete Truck	17	Paved	60	0.001	0.000	0.82	0.00
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						22.44	2.17

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 12
Substation Construction Emissions
Civil

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

**Table 13
Substation Construction Emissions
Control Building**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.09	0.09	0.00	0.00	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	14.48	1.45	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.09	0.09	0.00	14.48	1.45	0.4
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	3.6
Total	0.17	1.32	0.20	0.00	14.80	1.47	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Carry-all Truck	2	20	2	5
Stake Truck	1	20	2	5
Offsite				
Worker Commute	6	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Carry-all Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

**Table 13
Substation Construction Emissions
Control Building**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Carry-all Truck	0.01	0.06	0.06	0.00	0.00	0.00
Stake Truck	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.09	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.17	1.32	0.20	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Carry-all Truck	0.3	0.0	0.3
Stake Truck	0.1	0.0	0.1
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	4.0	0.0	4.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Carry-all Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Stake Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Onsite Total						14.48	1.45
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						14.77	1.45

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 14
Substation Construction Emissions
Electrical

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.85	9.25	6.15	0.02	0.25	0.23	206.2
Onsite Motor Vehicle Exhaust	0.01	0.10	0.01	0.00	0.00	0.00	4.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	16.69	1.67	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.87	9.35	6.16	0.02	16.94	1.90	210.8
Offsite Motor Vehicle Exhaust	0.39	3.08	0.26	0.01	0.09	0.06	136.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	0.39	3.08	0.26	0.01	0.81	0.06	136.1
Total	1.26	12.43	6.41	0.03	17.75	1.96	346.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Scissor Lift	87	2	300	5
Manlift	43	2	300	7
Reach Manlift	87	2	300	6
15-Ton Crane	125	1	300	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Scissor Lift	0.18	2.26	1.50	0.00	0.06	0.06
Manlift	0.23	1.89	1.71	0.00	0.05	0.04
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.85	9.25	6.15	0.02	0.25	0.23

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Scissor Lift	51.8	0.0	51.9
Manlift	37.4	0.0	37.4
Reach Manlift	62.2	0.0	62.2
15-Ton Crane	54.7	0.0	54.7
Total	206.0	0.0	206.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	6	300	2	5
Offsite				
Worker Commute	15	300	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

**Table 14
Substation Construction Emissions
Electrical**

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.10	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	0.39	3.08	0.26	0.01	0.09	0.06
Total	0.40	3.19	0.27	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	4.5	0.0	4.5
Onsite Total	4.5	0.0	4.5
Offsite			
Worker Commute	136.0	0.0	136.1
Offsite Total	136.0	0.0	136.1
Total	140.6	0.0	140.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	6	Unpaved	5	0.556	0.056	16.69	1.67
Onsite Total						16.69	1.67
Offsite							
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						17.41	1.67

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 15
Substation Construction Emissions
Wiring**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.07	0.54	0.49	0.00	0.01	0.01	8.9
Onsite Motor Vehicle Exhaust	0.01	0.07	0.01	0.00	0.00	0.00	2.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	11.13	1.11	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.08	0.61	0.49	0.00	11.14	1.13	11.4
Offsite Motor Vehicle Exhaust	0.21	1.65	0.14	0.01	0.05	0.03	60.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.21	1.65	0.14	0.01	0.43	0.03	60.5
Total	0.28	2.25	0.63	0.01	11.58	1.16	71.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	1	250	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.07	0.54	0.49	0.00	0.01	0.01

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	8.9	0.0	8.9
Total	8.9	0.0	8.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	250	2	5
Offsite				
Worker Commute	8	250	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 15
Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.07	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.21	1.65	0.14	0.01	0.05	0.03
Total	0.22	1.71	0.14	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	2.5	0.0	2.5
Onsite Total	2.5	0.0	2.5
Offsite			
Worker Commute	60.5	0.0	60.5
Offsite Total	60.5	0.0	60.5
Total	63.0	0.0	63.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	0.556	0.056	11.13	1.11
Onsite Total						11.13	1.11
Offsite							
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.38	0.00
Total						11.51	1.11

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 16
Substation Construction Emissions
Transformers**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.38	4.10	1.98	0.01	0.09	0.08	27.4
Onsite Motor Vehicle Exhaust	0.02	0.11	0.10	0.00	0.01	0.00	2.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	20.78	2.08	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.40	4.21	2.08	0.01	20.87	2.16	30.0
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	27.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	27.2
Total	0.66	6.27	2.25	0.01	21.41	2.20	57.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Crane	125	1	90	6
Forklift	83	1	90	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Crane	0.28	2.85	1.38	0.01	0.07	0.07
Forklift	0.10	1.25	0.60	0.00	0.01	0.01
Total	0.38	4.10	1.98	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Crane	19.7	0.0	19.7
Forklift	7.6	0.0	7.7
Total	27.3	0.0	27.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	90	2	5
Low Bed Truck	1	90	4	10
Offsite				
Worker Commute	10	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Low Bed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

**Table 16
Substation Construction Emissions
Transformers**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Low Bed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.10	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.17	0.27	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.9	0.0	0.9
Low Bed Truck	1.7	0.0	1.7
Onsite Total	2.6	0.0	2.6
Offsite			
Worker Commute	27.2	0.0	27.2
Offsite Total	27.2	0.0	27.2
Total	29.8	0.0	29.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	0.556	0.056	11.13	1.11
Low Bed Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Onsite Total						20.78	2.08
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						21.26	2.08

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.02	0.12	0.12	0.00	0.01	0.00	1.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	15.20	1.52	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.02	0.12	0.12	0.00	15.21	1.52	1.6
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	7.3
Total	0.12	0.94	0.19	0.00	15.42	1.54	8.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Maintenance Truck	2	60	4	10
Offsite				
Worker Commute	4	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Maintenance Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Maintenance Truck	0.02	0.12	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.12	0.12	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.94	0.19	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Maintenance Truck	1.6	0.0	1.6
Onsite Total	1.6	0.0	1.6
Offsite			
Worker Commute	7.3	0.0	7.3
Offsite Total	7.3	0.0	7.3
Total	8.8	0.0	8.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Maintenance Truck	2	Unpaved	10	0.760	0.076	15.20	1.52
Onsite Total						15.20	1.52
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						15.39	1.52

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 18
Substation Construction Emissions
Testing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.05	0.00	0.00	0.00	0.00	1.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	8.35	0.83	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.05	0.00	0.00	8.35	0.84	1.5
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	24.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	24.2
Total	0.11	0.87	0.07	0.00	8.56	0.85	25.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	200	3	7.5
Offsite				
Worker Commute	4	200	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 18
Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.05	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.05	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.87	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	1.5	0.0	1.5
Onsite Total	1.5	0.0	1.5
Offsite			
Worker Commute	24.2	0.0	24.2
Offsite Total	24.2	0.0	24.2
Total	25.7	0.0	25.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Unpaved	7.5	0.556	0.056	8.35	0.83
Onsite Total						8.35	0.83
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						8.54	0.83

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 19
Substation Construction Emissions
Asphalting**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.33	4.62	0.01	0.21	0.19	12.0
Onsite Motor Vehicle Exhaust	0.02	0.11	0.17	0.00	0.01	0.01	1.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	22.45	2.25	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Asphaltic Paving VOC	0.6	--	--	--	--	--	--
Onsite Total	1.52	6.44	4.79	0.01	22.67	2.44	13.2
Offsite Motor Vehicle Exhaust	0.89	5.42	7.45	0.04	0.44	0.32	53.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.11	0.00	
Offsite Total	0.89	5.42	7.45	0.04	1.54	0.32	53.6
Total	2.41	11.86	12.23	0.05	24.21	2.77	66.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Paving Roller	46	2	30	4
Asphalt Paver	152	1	30	4
Tractor	45	1	30	3
Asphalt Curb Machine	35	1	30	3

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Paving Roller	46	0.034	0.226	0.178	0.000	0.007	0.006	25.983	0.003	Rollers
Asphalt Paver	152	0.090	0.754	0.524	0.001	0.029	0.026	128.285	0.008	Pavers
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Asphalt Curb Machine	35	0.047	0.235	0.179	0.000	0.010	0.009	23.927	0.004	Paving Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Paving Roller	0.28	1.81	1.42	0.00	0.05	0.05
Asphalt Paver	0.36	3.02	2.10	0.01	0.11	0.11
Tractor	0.09	0.80	0.57	0.00	0.01	0.01
Asphalt Curb Machine	0.14	0.71	0.54	0.00	0.03	0.03
Total	0.87	6.33	4.62	0.01	0.21	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Paving Roller	2.8	0.0	2.8
Asphalt Paver	7.0	0.0	7.0
Tractor	1.2	0.0	1.2
Asphalt Curb Machine	1.0	0.0	1.0
Total	12.0	0.0	12.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Stake Truck	1	30	4	10
Dump Truck	1	30	3	7.5
Crew Truck	2	30	2	5
Offsite				
Asphalt Delivery Truck	13	30	N/A	60
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Asphalt delivery trucks based on 3,900 CY over 30 days and 10 CY/truck = 3,900 / 30 / 10 = 13

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 19
Substation Construction Emissions
Asphalting

Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Asphalt Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Stake Truck	0.01	0.04	0.09	0.00	0.00	0.00
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.17	0.00	0.01	0.01
Offsite						
Asphalt Delivery Truck	0.63	3.36	7.27	0.03	0.38	0.28
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.89	5.42	7.45	0.04	0.44	0.32
Total	0.91	5.53	7.61	0.04	0.45	0.33

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Stake Truck	0.6	0.0	0.6
Dump Truck	0.4	0.0	0.4
Crew Truck	0.2	0.0	0.2
Onsite Total	1.2	0.0	1.2
Offsite			
Asphalt Delivery Truck	44.5	0.0	44.5
Worker Commute	9.1	0.0	9.1
Offsite Total	53.6	0.0	53.6
Total	54.7	0.0	54.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Stake Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Dump Truck	1	Unpaved	7.5	0.965	0.097	7.24	0.72
Crew Truck	2	Unpaved	5	0.556	0.056	5.56	0.56
Onsite Total						22.45	2.25
Offsite							
Asphalt Delivery Truck	13	Paved	60	0.001	0.000	0.62	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.11	0.00
Total						23.56	2.25

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Asphaltic Paving VOC Emissions

Area Paved (acre/day) ^a	Emission Factor (lb/acre) ^b	VOC (lb/day) ^c
0.24	2.62	0.6

^a Assumed twice daily average for 156,000 ft² total in 30 days:

2 x 156,000 ft² / 30 days / 43,560 ft² per acre = 0.24 acres

^b From URBEMISS 2007 User's Guide, Appendix A,

<http://www.urbemis.com/software/download.html>

^c Emissions [lb/day] = Emission factor [lb/acre] x Area paved [acre/day]

Table 20
Substation Construction Emissions
Landscaping

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	2.71	1.73	0.00	0.03	0.03	6.9
Onsite Motor Vehicle Exhaust	0.01	0.10	0.08	0.00	0.01	0.00	1.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	18.37	1.84	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.30	2.81	1.80	0.00	18.41	1.87	8.0
Offsite Motor Vehicle Exhaust	1.42	8.26	13.60	0.06	0.76	0.56	136.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.63	0.00	
Offsite Total	1.42	8.26	13.60	0.06	2.39	0.56	136.9
Total	1.72	11.07	15.40	0.07	20.80	2.43	144.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Tractor	45	1	45	7
Forklift	83	1	45	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Tractor	0.22	1.87	1.33	0.00	0.03	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.29	2.71	1.73	0.00	0.03	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Tractor	4.3	0.0	4.3
Forklift	2.5	0.0	2.6
Total	6.9	0.0	6.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	1	45	3	7.5
Crew Truck	4	45	2	5
Offsite				
Crushed Rock Delivery Truck	24	45	N/A	60
Worker Commute	10	45	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Crushed rock delivery trucks based on 10,800 CY over 45 days and 10 CY/truck = 10,800 / 45 / 10 = 24

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Crushed Rock Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 20
Substation Construction Emissions
Landscaping

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.08	0.00	0.01	0.00
Offsite						
Crushed Rock Delivery Truck	1.15	6.21	13.43	0.06	0.70	0.52
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	1.42	8.26	13.60	0.06	0.76	0.56
Total	1.43	8.36	13.68	0.06	0.76	0.57

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.6	0.0	0.6
Crew Truck	0.5	0.0	0.5
Onsite Total	1.1	0.0	1.1
Offsite			
Crushed Rock Delivery Truck	123.3	0.0	123.3
Worker Commute	13.6	0.0	13.6
Offsite Total	136.9	0.0	136.9
Total	138.0	0.0	138.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	1	Unpaved	7.5	0.965	0.097	7.24	0.72
Crew Truck	4	Unpaved	5	0.556	0.056	11.13	1.11
Onsite Total						18.37	1.84
Offsite							
Crushed Rock Delivery Truck	24	Paved	60	0.001	0.000	1.15	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.63	0.00
Total						20.00	1.84

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 21
500 kV Transmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.11	0.89	0.08	0.00	0.03	0.02	0.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	9.30	0.91	
Offsite Total	0.11	0.89	0.08	0.00	9.32	0.93	0.5
Total	0.11	0.89	0.08	0.00	9.32	0.93	0.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1/2-Ton Pick-up Truck, 4x4	2	4	N/A	10
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1/2-Ton Pick-up Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 21
500 kV Transmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1/2-Ton Pick-up Truck, 4x4	0.01	0.07	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.11	0.89	0.08	0.00	0.03	0.02
Total	0.11	0.89	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1/2-Ton Pick-up Truck, 4x4	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	0.5	0.0	0.5
Total	0.5	0.0	0.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1/2-Ton Pick-up Truck, 4x4	2	Unpaved	10	0.455	0.046	9.10	0.91
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						9.30	0.91
Total						9.30	0.91

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.41	3.14	1.79	0.01	0.06	0.06	55.8
Onsite Motor Vehicle Exhaust	0.02	0.10	0.14	0.00	0.01	0.01	4.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	14.01	1.40	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.43	3.24	1.93	0.01	14.08	1.47	59.9
Offsite Motor Vehicle Exhaust	0.20	1.41	0.87	0.01	0.06	0.04	27.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.28	0.00	
Offsite Total	0.20	1.41	0.87	0.01	0.35	0.04	27.9
Total	0.63	4.65	2.81	0.02	14.43	1.51	87.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	137	5
Rough Terrain Forklift	125	1	137	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.27	1.16	1.35	0.01	0.05	0.04
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.41	3.14	1.79	0.01	0.06	0.06

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	34.8	0.0	34.9
Rough Terrain Forklift	20.9	0.0	20.9
Total	55.7	0.0	55.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	1	137	4	10
Jet A Fuel Truck	1	137	0.5	1.25
Water Truck	1	137	1	2.5
Offsite				
Flat Bed Truck/Trailer	1	10	N/A	60
Concrete Mixer Truck	1	10	N/A	10
Jet A Fuel Truck	1	137	N/A	20
Water Truck	1	137	N/A	20
Worker Commute	4	137	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Flat Bed Truck/Trailer	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Jet A Fuel Truck	0.00	0.01	0.01	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.02	0.10	0.14	0.00	0.01	0.01
Offsite						
Flat Bed Truck/Trailer	0.06	0.36	0.37	0.00	0.02	0.01
Concrete Mixer Truck	0.01	0.06	0.06	0.00	0.00	0.00
Jet A Fuel Truck	0.02	0.09	0.19	0.00	0.01	0.01
Water Truck	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.20	1.41	0.87	0.01	0.06	0.04
Total	0.22	1.51	1.02	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Truck, Semi Tractor	1.3	0.0	1.3
Jet A Fuel Truck	0.33	0.00	0.33
Water Truck	0.65	0.00	0.65
Onsite Total	4.1	0.0	4.1
Offsite			
Flat Bed Truck/Trailer	0.8	0.0	0.8
Concrete Mixer Truck	0.1	0.0	0.1
Jet A Fuel Truck	5.21	0.00	5.21
Water Truck	5.21	0.00	5.21
Worker Commute	16.6	0.0	16.6
Offsite Total	27.9	0.0	27.9
Total	32.0	0.0	32.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	0.556	0.056	5.56	0.56
Truck, Semi Tractor	1	Unpaved	5	0.965	0.097	4.83	0.48
Jet A Fuel Truck	1	Unpaved	1.25	0.965	0.097	1.21	0.12
Water Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Onsite Total						14.01	1.40
Offsite							
Flat Bed Truck/Trailer	1	Paved	60	0.001	0.000	0.05	0.00
Concrete Mixer Truck	1	Paved	10	0.001	0.000	0.01	0.00
Jet A Fuel Truck	1	Paved	20	0.00	0.00	0.02	0.00
Water Truck	1	Paved	20	0.00	0.00	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.28	0.00
Total						14.29	1.40

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.09	16.82	9.96	0.05	0.45	0.42	44.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	9.17	1.91	
Onsite Total	2.09	16.82	9.96	0.05	9.63	2.33	44.9
Offsite Motor Vehicle Exhaust	0.28	2.18	0.37	0.01	0.07	0.05	8.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	20.52	2.00	
Offsite Total	0.28	2.18	0.37	0.01	20.59	2.05	8.3
Total	2.37	19.00	10.34	0.05	30.22	4.38	53.1

Construction Equipment Summary

Equipment	Horsepower	Number	Days Used	Hours Used/Day
Road Grader	250	1	24	6
Backhoe/Front Loader	125	1	24	8
Drum Type Compactor	100	1	24	6
Track Type Dozer	150	1	24	8
Excavator	250	1	24	6

Construction Equipment Exhaust Emission Factors

Equipment	Horsepower	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Track Type Dozer	0.66	5.81	3.56	0.01	0.19	0.18
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	2.09	16.82	9.96	0.05	0.45	0.42

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	11.2	0.0	11.3
Backhoe/Front Loader	8.8	0.0	8.8
Drum Type Compactor	3.9	0.0	3.9
Track Type Dozer	10.6	0.0	10.6
Excavator	10.4	0.0	10.4
Total	44.8	0.0	44.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	24	N/A	5
Water Truck	2	24	N/A	5
Lowboy Truck/Trailer	1	24	N/A	5
Worker Commute	10	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Lowboy Truck/Trailer	0.00	0.02	0.05	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.28	2.18	0.37	0.01	0.07	0.05
Total	0.28	2.18	0.37	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.5	0.0	0.5
Lowboy Truck/Trailer	0.2	0.0	0.2
Worker Commute	7.3	0.0	7.3
Offsite Total	8.3	0.0	8.3
Total	8.3	0.0	8.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Water Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Lowboy Truck/Trailer	1	Unpaved	5	0.965	0.097	4.83	0.48
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						20.52	2.00
Total						20.52	2.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	4,334	9.94E-04	2.07E-04	4.31	0.90
Bulldozing, Scraping and Grading	hr/day	14	0.348	0.072	4.87	1.01
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					9.17	1.91

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate 80,000 CY of cut plus 50,000 CY of fill yields 130,000 CY of soil handling over 30 days. Approx 4,334 CY/day.

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	28.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	--
Earthwork Fugitive PM	--	--	--	--	1.38	0.29	--
Onsite Total	1.15	15.80	7.68	0.03	1.62	0.51	28.5
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	4.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	--
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	4.4
Total	1.30	17.03	7.78	0.03	1.94	0.53	32.9

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	24	8
Grout Machine	60	1	24	8
Drill Rig	75	1	24	8
Transfer Pump	60	1	24	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	7.7	0.0	7.7
Grout Machine	7.0	0.0	7.0
Drill Rig	6.7	0.0	6.7
Transfer Pump	7.0	0.0	7.0
Total	28.5	0.0	28.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	4.4	0.0	4.4
Offsite Total	4.4	0.0	4.4
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	1,388	9.94E-04	2.07E-04	1.38	0.29
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					1.38	0.29

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Offsite Motor Vehicle Exhaust	0.27	2.03	0.63	0.01	0.07	0.05	1.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	47.51	4.71	
Offsite Total	0.27	2.03	0.63	0.01	47.58	4.76	1.4
Total	1.02	6.57	4.56	0.02	47.74	4.91	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	4	8
Rough Terrain Crane (L)	275	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Rough Terrain Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Rough Terrain Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.75	4.54	3.93	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.7	0.0	0.7
Rough Terrain Crane (L)	2.0	0.0	2.0
Total	2.6	0.0	2.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
1-Ton Flat Bed, 4x4	2	4	N/A	20
Flat Bed Truck/Trailer	1	4	N/A	20
Worker Commute	8	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHV	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
1-Ton Flat Bed, 4x4	0.04	0.24	0.25	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.27	2.03	0.63	0.01	0.07	0.05
Total	0.27	2.03	0.63	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
1-Ton Flat Bed, 4x4	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.2	0.0	0.2
Worker Commute	1.0	0.0	1.0
Offsite Total	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.ciimateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
1-Ton Flat Bed, 4x4	2	Unpaved	20	0.556	0.056	22.26	2.23
Flat Bed Truck/Trailer	1	Unpaved	20	0.965	0.097	19.30	1.93
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						47.51	4.71
Total						47.51	4.71

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Offsite Motor Vehicle Exhaust	0.13	0.97	0.22	0.00	0.03	0.02	0.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	22.28	2.21	
Offsite Total	0.13	0.97	0.22	0.00	22.31	2.23	0.6
Total	0.61	6.89	2.73	0.01	22.42	2.33	1.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	2	8
Backhoe/Front Loader	125	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Total	0.48	5.92	2.51	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.3	0.0	0.3
Backhoe/Front Loader	0.6	0.0	0.6
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	1	4	N/A	5
Dump Truck	1	2	N/A	20
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.00	0.03	0.03	0.00	0.00	0.00
Dump Truck	0.02	0.12	0.12	0.00	0.01	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.22	0.00	0.03	0.02
Total	0.13	0.97	0.22	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.0	0.0	0.0
Dump Truck	0.1	0.0	0.1
Worker Commute	0.5	0.0	0.5
Offsite Total	0.6	0.0	0.6
Total	0.6	0.0	0.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	1	Unpaved	5	0.556	0.056	2.78	0.28
Dump Truck	1	Unpaved	20	0.965	0.097	19.30	1.93
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						22.28	2.21
Total						22.28	2.21

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.73	13.83	6.02	0.05	0.23	0.21	53.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	--
Earthwork Fugitive PM	--	--	--	--	0.20	0.04	--
Onsite Total	1.73	13.83	6.02	0.05	0.43	0.26	53.6
Offsite Motor Vehicle Exhaust	0.28	2.10	0.64	0.01	0.08	0.05	10.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	48.42	4.80	--
Offsite Total	0.28	2.10	0.64	0.01	48.49	4.85	10.1
Total	2.01	15.93	6.66	0.06	48.92	5.11	63.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	30	7
Backhoe/Front Loader	125	1	30	10
Low Drill	385	1	16	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Low Drill	385	0.071	0.551	0.162	0.003	0.006	0.005	311.309	0.006	Bore/Drill Rigs

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.60	2.47	2.78	0.01	0.10	0.09
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Low Drill	0.71	5.51	1.62	0.03	0.06	0.05
Total	1.73	13.83	6.02	0.05	0.23	0.21

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	17.2	0.0	17.2
Backhoe/Front Loader	13.8	0.0	13.8
Low Drill	22.6	0.0	22.6
Total	53.5	0.0	53.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	30	N/A	5
Water Truck	1	30	N/A	5
Dump Truck	1	30	N/A	10
Concrete Mixer Truck	3	18	N/A	10
Worker Commute	9	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Concrete Mixer Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.24	1.85	0.16	0.01	0.05	0.03
Offsite Total	0.28	2.10	0.64	0.01	0.08	0.05
Total	0.28	2.10	0.64	0.01	0.08	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
Water Truck	0.3	0.0	0.3
Dump Truck	0.6	0.0	0.6
Concrete Mixer Truck	1.0	0.0	1.0
Worker Commute	8.2	0.0	8.2
Offsite Total	10.0	0.0	10.1
Total	10.0	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	5	0.455	0.046	4.55	0.46
Water Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Dump Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Concrete Mixer Truck	3	Unpaved	10	0.965	0.097	28.95	2.90
Worker Commute	9	Paved	60	0.001	0.000	0.43	0.00
Offsite Total						48.42	4.80
Total						48.42	4.80

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	200	9.94E-04	2.07E-04	0.20	0.04
Buildozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.20	0.04

^a From Table 57

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

^a Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]
^b Estimate

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	17.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	17.4
Total	1.30	17.03	7.78	0.03	0.56	0.24	122.1

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	96	8
Grout Machine	60	1	80	8
Drill Rig	75	1	96	8
Transfer Pump	60	1	80	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	0.042814	0.500686	0.28637	0.001746	0.0041623	PM2.5 (lb/hr) ^b	164.8678	0.003863	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	30.8	0.0	30.9
Grout Machine	23.5	0.0	23.5
Drill Rig	26.9	0.0	26.9
Transfer Pump	23.5	0.0	23.5
Total	104.6	0.0	104.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT].
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	96	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	17.4	0.0	17.4
Offsite Total	17.4	0.0	17.4
Total	17.4	0.0	17.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Offsite Motor Vehicle Exhaust	0.13	0.97	0.32	0.00	0.04	0.02	1.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	25.06	2.49	
Offsite Total	0.13	0.97	0.32	0.00	25.10	2.51	1.7
Total	0.31	3.62	0.90	0.01	25.12	2.53	3.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.18	2.65	0.59	0.01	0.02	0.02
Total	0.18	2.65	0.59	0.01	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	2	10	N/A	5
Flat Bed Truck/Trailer	1	10	N/A	20
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.32	0.00	0.04	0.02
Total	0.13	0.97	0.32	0.00	0.04	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	0.1	0.0	0.1
Flat Bed Truck/Trailer	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.7	0.0	1.7
Total	1.7	0.0	1.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Flat Bed Truck/Trailer	1	Unpaved	20	0.965	0.097	19.30	1.93
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						25.06	2.49
Total						25.06	2.49

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Offsite Motor Vehicle Exhaust	0.29	2.24	0.36	0.01	0.07	0.04	13.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	15.15	1.47	
Offsite Total	0.29	2.24	0.36	0.01	15.22	1.51	13.7
Total	0.98	8.03	3.96	0.02	15.36	1.64	38.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	40	6
RT Crane (M)	215	1	40	6
Compressor Trailer	60	1	40	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.70	5.79	3.60	0.02	0.14	0.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	6.1	0.0	6.1
RT Crane (M)	12.2	0.0	12.2
Compressor Trailer	6.8	0.0	6.8
Total	25.1	0.0	25.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	40	N/A	10
1-Ton Crew Cab Flat Bed, 4x4	2	40	N/A	5
Worker Commute	10	40	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.02	0.12	0.12	0.00	0.01	0.00
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.29	2.24	0.36	0.01	0.07	0.04
Total	0.29	2.24	0.36	0.01	0.07	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.0	0.0	1.0
1-Ton Crew Cab Flat Bed, 4x4	0.5	0.0	0.5
Worker Commute	12.1	0.0	12.1
Offsite Total	13.7	0.0	13.7
Total	13.7	0.0	13.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	10	0.455	0.046	9.10	0.91
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						15.15	1.47
Total						15.15	1.47

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Offsite Motor Vehicle Exhaust	0.38	2.91	0.67	0.01	0.09	0.06	15.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	37.75	3.72	
Offsite Total	0.38	2.91	0.67	0.01	37.85	3.78	15.2
Total	1.46	8.84	6.22	0.03	38.06	3.98	33.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	33	8
RT Crane (M)	215	1	22	6
RT Crane (L)	275	1	11	6

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
RT Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
RT Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	1.07	5.93	5.55	0.02	0.21	0.20

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	5.6	0.0	5.6
RT Crane (M)	6.7	0.0	6.7
RT Crane (L)	5.4	0.0	5.4
Total	17.7	0.0	17.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	3	33	N/A	15
1-Ton Crew Cab Flat Bed, 4x4	2	33	N/A	15
Worker Commute	12	33	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.04	0.27	0.28	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.31	2.47	0.21	0.01	0.07	0.05
Offsite Total	0.38	2.91	0.67	0.01	0.09	0.06
Total	0.38	2.91	0.67	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.9	0.0	1.9
1-Ton Crew Cab Flat Bed, 4x4	1.3	0.0	1.3
Worker Commute	12.0	0.0	12.0
Offsite Total	15.2	0.0	15.2
Total	15.2	0.0	15.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	3	Unpaved	15	0.455	0.046	20.48	2.05
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	15	0.556	0.056	16.69	1.67
Worker Commute	12	Paved	60	0.001	0.000	0.58	0.00
Offsite Total						37.75	3.72
Total						37.75	3.72

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29b

**500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.59	4.56	0.81	0.01	0.14	0.09	5.0
Offsite Helicopter Exhaust	0.23	2.42	1.54	0.00	0.07	0.07	1.36
Offsite Motor Vehicle Fugitive PM	--	--	--	--	42.75	4.18	
Offsite Total	0.82	6.98	2.35	0.02	42.96	4.34	6.4
Total	0.82	6.98	2.35	0.02	42.96	4.34	6.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	8	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.23	2.42	1.54	0.00	0.07	0.07

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	2	N/A	15
1-Ton Truck, 4x4	2	2	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	15
Worker Commute	20	8	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29b
500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Fuel, Helicopter Support Truck	0.01	0.09	0.09	0.00	0.00	0.00
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.59	4.56	0.81	0.01	0.14	0.09
Total	0.59	4.56	0.81	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.1	0.0	0.1
1-Ton Truck, 4x4	0.1	0.0	0.1
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	4.8	0.0	4.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	15	0.455	0.046	13.66	1.37
1-Ton Truck, 4x4	2	Unpaved	15	0.455	0.046	13.66	1.37
Fuel, Helicopter Support Truck	1	Unpaved	15	0.965	0.097	14.48	1.45
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						42.75	4.18
Total						42.75	4.18

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29c

**500 kV Transmission Line Construction Emissions
Tower Helicopter Operations**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Helicopter Exhaust	46.71	56.80	577.42	32.18	12.02	12.02	1626.43
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Offsite Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4
Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Kaman K-Max	1500	1	120	8
Hughes 500E Helicopter	317	1	127	12
Sikorsky S64	9000	1	7	12

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Kaman K-Max	1500	1.129	1.353	7.403	0.626	0.201	0.201	1978.170	0.055	See note c
Hughes 500E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039	0.019	See note c
Sikorsky S64	9000	1.786	2.088	47.051	2.464	0.966	0.966	7788.012	0.216	See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5, CO2, and CH4 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications,

DETEC, Federal Office of Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009.

Downloaded from <http://www.bazl.admin.ch/experten/regulation/03312/03419/03532/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.75 kg/gal from Table 13.1 of 2013 Climate Registry Default Emission Factors, downloaded from

<http://www.theclimaterestry.org/downloads/2013/01/2013-Climat-Registry-Default-Emissions-Factors.pdf>

CH4 emission factor = 0.27 g/gal from Table 13.7 of 2013 Climate Registry Default Emission Factors

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Kaman K-Max	9.03	10.83	59.22	5.01	1.60	1.60
Hughes 500E Helicopter	25.27	31.74	12.80	2.61	0.42	0.42
Sikorsky S64	21.44	25.06	564.62	29.57	11.60	11.60
Total^b	46.71	56.80	577.42	32.18	12.02	12.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

^b Total daily emissions assume that the Kaman K-Max and Sikorsky S64 would not operate on the same day.

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Kaman K-Max	861.4	0.0	861.9
Hughes 500E Helicopter	467.3	0.0	467.6
Sikorsky S64	296.7	0.0	296.9
Total	1,625.5	0.0	1,626.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO2-equivalent (CO2e) emission factors are CO2 emissions plus 21 x CH4 emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateestry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
None				

^a Onsite travel based on 25% use at 10 mph average speed.

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
1-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
Fuel, Helicopter Support Truck	0.00	0.00	0.00	0.00	0.00	0.00
Worker Commute	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
1-Ton Truck, 4x4	0.0	0.0	0.0
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	0.0	0.0	0.0
Offsite Total	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
None						0.00	0.00
Offsite Total						0.00	0.00
Total						0.00	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	5.93	32.28	29.00	0.15	1.00	0.92	0.00
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	5.93	32.28	29.00	0.15	1.00	0.92	0.0
Offsite Motor Vehicle Exhaust	1.70	12.93	3.12	0.04	0.42	0.29	18.5
Offsite Helicopter Exhaust	12.64	15.87	6.40	1.31	0.21	0.21	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	173.42	17.08	
Offsite Total	14.34	28.80	9.52	1.35	174.06	17.58	18.5
Total	20.27	61.08	38.52	1.51	175.06	18.50	18.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	2	9	8
RT Crane (M)	215	2	9	6
Boom/Crane Truck	350	2	9	6
Spacing Cart	10	2	3	8
Static Truck/Tensioner	350	1	9	6
3 Drum Straw Sock Puller	300	1	4	6
Bull Wheel Puller	525	1	5	6
Sag Cat w/ winches	350	2	9	4
Backhoe/Front Loader	125	1	9	4
D8 Cat	350	2	9	4
Hughes 500 E Helicopter	N/A	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Spacing Cart	10	0.012	0.062	0.074	0.000	0.003	0.003	10.107	0.001	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Sock Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Bull Wheel Puller	525	0.044	0.347	0.202	0.001	0.007	0.006	122.505	0.004	Other Construction Equipment
Sag Cat w/ winches	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
D8 Cat	350	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Hughes 500 E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039		See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5 and CO2 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications, DETEC, Federal Office of

Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009. Downloaded from <http://www.bazl.admin.ch/fachleute/01169/01174/01628/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet-A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.57 kg/gal from Table C.3 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008.

Downloaded from http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.93	5.94	5.86	0.03	0.17	0.16
RT Crane (M)	0.65	2.78	3.25	0.02	0.11	0.10
Boom/Crane Truck	1.03	4.24	4.77	0.02	0.18	0.16
Spacing Cart	0.19	0.99	1.18	0.00	0.05	0.04
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
3 Drum Straw Sock Puller	0.48	2.76	1.82	0.01	0.06	0.05
Bull Wheel Puller	0.27	2.08	1.21	0.01	0.04	0.04
Sag Cat w/ winches	0.63	3.68	2.43	0.02	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
D8 Cat	1.11	4.70	6.02	0.02	0.22	0.21
Hughes 500 E Helicopter	12.64	15.87	6.40	1.31	0.21	0.21
Total	18.56	48.15	35.40	1.46	1.21	1.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	13.9	0.0	13.9
RT Crane (M)	5.5	0.0	5.5
Boom/Crane Truck	8.8	0.0	8.8
Spacing Cart	0.2	0.0	0.2
Static Truck/Tensioner	6.2	0.0	6.2
3 Drum Straw Sock Puller	2.8	0.0	2.8
Bull Wheel Puller	1.7	0.0	1.7
Sag Cat w/ winches	8.3	0.0	8.3
Backhoe/Front Loader	1.7	0.0	1.7
D8 Cat	8.5	0.0	8.5
Hughes 500 E Helicopter	3.7	0.0	3.7
Total	61.2	0.0	61.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	4	9	N/A	20
1-Ton Crew Cab, 4x4	6	9	N/A	20
Wire Truck/Trailer	4	6	N/A	5
Dump Truck	1	9	N/A	5
Lowboy Truck/Trailer	3	9	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	30
Worker Commute	55	9	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Fuel, Helicopter Support Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.07	0.48	0.49	0.00	0.02	0.02
1-Ton Crew Cab, 4x4	0.11	0.71	0.74	0.00	0.03	0.03
Wire Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Dump Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.04	0.19	0.42	0.00	0.02	0.02
Fuel, Helicopter Support Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	1.44	11.31	0.95	0.04	0.32	0.21
Offsite Total	1.70	12.93	3.12	0.04	0.42	0.29
Total	1.70	12.93	3.12	0.04	0.42	0.29

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.9	0.0	0.9
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Wire Truck/Trailer	0.2	0.0	0.2
Dump Truck	0.1	0.0	0.1
Lowboy Truck/Trailer	0.8	0.0	0.8
Fuel, Helicopter Support Truck	0.1	0.0	0.1
Worker Commute	15.0	0.0	15.0
Offsite Total	18.5	0.0	18.5
Total	18.5	0.0	18.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	4	Unpaved	20	0.455	0.046	36.42	3.64
1-Ton Crew Cab, 4x4	6	Unpaved	20	0.556	0.056	66.77	6.68
Wire Truck/Trailer	4	Unpaved	5	0.965	0.097	19.30	1.93
Dump Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Lowboy Truck/Trailer	3	Unpaved	15	0.965	0.097	43.43	4.34
Fuel, Helicopter Support Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	55	Paved	60	0.001	0.000	2.64	0.00
Offsite Total						173.42	17.08
Total						173.42	17.08

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.75	4.42	0.02	0.19	0.17	3.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	2.58	0.54	
Onsite Total	0.87	6.75	4.42	0.02	2.77	0.71	3.3
Offsite Motor Vehicle Exhaust	0.20	1.56	0.32	0.01	0.05	0.03	1.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	20.38	2.00	
Offsite Total	0.20	1.56	0.32	0.01	20.43	2.04	1.0
Total	1.08	8.31	4.75	0.03	23.20	2.75	4.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	4	6
Backhoe/Front Loader	125	1	4	4
Drum Type Compactor	100	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.87	6.75	4.42	0.02	0.19	0.17

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	1.9	0.0	1.9
Backhoe/Front Loader	0.7	0.0	0.7
Drum Type Compactor	0.6	0.0	0.6
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
Water Truck	1	4	N/A	5
Lowboy Truck/Trailer	1	4	N/A	10
Worker Commute	7	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.01	0.04	0.09	0.00	0.00	0.00
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.20	1.56	0.32	0.01	0.05	0.03
Total	0.20	1.56	0.32	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
Water Truck	0.0	0.0	0.0
Lowboy Truck/Trailer	0.1	0.0	0.1
Worker Commute	0.8	0.0	0.8
Offsite Total	1.0	0.0	1.0
Total	1.0	0.0	1.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Water Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Lowboy Truck/Trailer	1	Unpaved	10	0.965	0.097	9.65	0.97
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						20.38	2.00
Total						20.38	2.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day	6	0.348	0.072	2.09	0.43
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					2.58	0.54

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.12	0.96	0.08	0.00	0.03	0.02	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5
Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	18	8	20
Worker Commute	4	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.02	0.14	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.12	0.96	0.08	0.00	0.03	0.02
Total	0.12	0.96	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.4	0.0	0.4
Worker Commute	2.2	0.0	2.2
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	20	0.001	0.000	0.03	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.25	2.45	0.98	0.01	0.04	0.03	92.9
Onsite Motor Vehicle Exhaust	0.01	0.08	0.11	0.00	0.01	0.00	8.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	10.39	1.04	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.26	2.53	1.09	0.01	10.43	1.08	101.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	44.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	44.2
Total	0.36	3.35	1.16	0.01	10.65	1.09	145.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	365	2
Rough Terrain Forklift	125	1	365	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.11	0.46	0.54	0.00	0.02	0.02
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.25	2.45	0.98	0.01	0.04	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	37.1	0.0	37.2
Rough Terrain Forklift	55.7	0.0	55.7
Total	92.8	0.0	92.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4	1	365	4	10
Truck, Semi Tractor	1	365	2	5
Offsite				
Worker Commute	4	365	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Truck, Semi Tractor	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Onsite Total	0.01	0.08	0.11	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.90	0.18	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	4.8	0.0	4.8
Truck, Semi Tractor	3.5	0.0	3.5
Onsite Total	8.2	0.0	8.2
Offsite			
Worker Commute	44.1	0.0	44.2
Offsite Total	44.1	0.0	44.2
Total	52.4	0.0	52.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	0.556	0.056	5.56	0.56
Truck, Semi Tractor	1	Unpaved	5	0.965	0.097	4.83	0.48
Onsite Total						10.39	1.04
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						10.58	1.04

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.60	12.73	7.49	0.04	0.34	0.31	109.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.97	0.10	
Earthwork Fugitive PM	--	--	--	--	3.58	0.74	
Onsite Total	1.60	12.73	7.50	0.04	4.88	1.15	109.5
Offsite Motor Vehicle Exhaust	0.18	1.34	0.55	0.01	0.05	0.04	19.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.18	1.34	0.55	0.01	0.34	0.04	19.3
Total	1.79	14.07	8.05	0.04	5.22	1.19	128.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	88	4
Backhoe/Front Loader	125	1	88	6
Drum Type Compactor	100	1	88	4
Track Type Dozer	150	1	88	6
Excavator	250	1	44	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.31	1.42	1.46	0.01	0.05	0.05
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.16	1.52	1.06	0.00	0.05	0.05
Track Type Dozer	0.49	4.36	2.67	0.01	0.14	0.13
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	1.60	12.73	7.49	0.04	0.34	0.31

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	27.5	0.0	27.5
Backhoe/Front Loader	24.3	0.0	24.3
Drum Type Compactor	9.4	0.0	9.4
Track Type Dozer	29.0	0.0	29.1
Excavator	19.0	0.0	19.0
Total	109.2	0.0	109.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	88	8	1
Offsite				
1-Ton Crew Cab, 4x4	1	88	N/A	30
Lowboy Truck/Trailer	1	44	N/A	30
Worker Commute	5	88	N/A	60

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.13	1.03	0.09	0.00	0.03	0.02
Offsite Total	0.18	1.34	0.55	0.01	0.05	0.04
Total	0.18	1.34	0.56	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab, 4x4	3.5	0.0	3.5
Lowboy Truck/Trailer	2.5	0.0	2.5
Worker Commute	13.3	0.0	13.3
Offsite Total	19.3	0.0	19.3
Total	19.4	0.0	19.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	0.965	0.097	0.97	0.10
Onsite Total						0.97	0.10
Offsite							
1-Ton Crew Cab, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	5	Paved	60	0.001	0.000	0.24	0.00
Offsite Total						0.29	0.00
Total						1.25	0.10

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	100	9.94E-04	2.07E-04	0.10	0.02
Bulldozing, Scraping and Grading	hr/day	10	0.348	0.072	3.48	0.72
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					3.58	0.74

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Offsite Motor Vehicle Exhaust	0.26	1.90	0.94	0.01	0.07	0.05	9.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.26	1.90	0.94	0.01	0.46	0.05	9.3
Total	1.61	10.08	7.33	0.05	0.69	0.27	53.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	26	6
Auger Truck	210	1	26	6
Boom/Crane Truck	350	1	26	8
Bucket Truck	250	1	26	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.17	1.81	1.16	0.00	0.05	0.05
Auger Truck	0.26	2.06	0.59	0.01	0.02	0.02
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.35	8.18	6.39	0.04	0.23	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	3.3	0.0	3.3
Auger Truck	13.3	0.0	13.3
Boom/Crane Truck	17.0	0.0	17.0
Bucket Truck	10.0	0.0	10.0
Total	43.7	0.0	43.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Pick-up Truck, 4x4	2	26	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	26	N/A	30
Extendable Flat Bed Pole Truck	1	26	N/A	30
Worker Commute	6	26	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Pick-up Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Pick-up Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.26	1.90	0.94	0.01	0.07	0.05
Total	0.26	1.90	0.94	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Pick-up Truck, 4x4	2.0	0.0	2.0
1-Ton Crew Cab Flat Bed, 4x4	1.0	0.0	1.0
Extendable Flat Bed Pole Truck	1.5	0.0	1.5
Worker Commute	4.7	0.0	4.7
Offsite Total	9.3	0.0	9.3
Total	9.3	0.0	9.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Pick-up Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.38	0.00
Total						0.38	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	7.3
Total	1.07	7.58	4.97	0.02	0.60	0.20	24.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	23	4
Boom/Crane Truck	350	1	23	6
Compressor Trailer	60	1	23	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.09	1.32	0.29	0.00	0.01	0.01
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.84	5.86	4.22	0.02	0.17	0.16

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.3	0.0	2.3
Boom/Crane Truck	11.3	0.0	11.3
Compressor Trailer	3.9	0.0	3.9
Total	17.5	0.0	17.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	23	N/A	30
Flat Bed Truck/Trailer	1	23	N/A	30
Worker Commute	6	23	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Flat Bed Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Flat Bed Truck/Trailer	1.3	0.0	1.3
Worker Commute	4.2	0.0	4.2
Offsite Total	7.3	0.0	7.3
Total	7.3	0.0	7.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Flat Bed Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	2.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	2.0
Total	0.98	5.99	4.23	0.02	0.69	0.18	5.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	5	5
Boom/Crane Truck	350	1	5	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.5	0.0	0.5
Boom/Crane Truck	2.5	0.0	2.5
Total	3.0	0.0	3.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Truck, 4x4	2	5	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	5	N/A	30
Worker Commute	8	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.4	0.0	0.4
1-Ton Crew Cab Flat Bed, 4x4	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.11	9.18	4.06	0.03	0.16	0.15	119.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.97	0.10	
Earthwork Fugitive PM	--	--	--	--	0.03	0.01	
Onsite Total	1.11	9.18	4.07	0.03	1.16	0.25	119.2
Offsite Motor Vehicle Exhaust	0.31	2.14	1.43	0.01	0.11	0.08	40.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.31	2.14	1.43	0.01	0.49	0.08	40.7
Total	1.41	11.32	5.50	0.05	1.65	0.33	159.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	96	5
Backhoe/Front Loader	125	1	96	8
Auger Truck	210	1	65	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.43	1.77	1.99	0.01	0.07	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Auger Truck	0.34	2.74	0.78	0.02	0.03	0.03
Total	1.11	9.18	4.06	0.03	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	39.2	0.0	39.2
Backhoe/Front Loader	35.3	0.0	35.3
Auger Truck	44.4	0.0	44.4
Total	118.9	0.0	119.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	96	8	1
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	1	96	N/A	30
Dump Truck	1	96	N/A	30
Concrete Mixer Truck	3	65	N/A	30
Worker Commute	7	96	N/A	60

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Concrete Mixer Truck	0.07	0.39	0.84	0.00	0.04	0.03
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.31	2.14	1.43	0.01	0.11	0.08
Total	0.31	2.14	1.43	0.01	0.11	0.08

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	3.8	0.0	3.8
Dump Truck	5.5	0.0	5.5
Concrete Mixer Truck	11.1	0.0	11.1
Worker Commute	20.3	0.0	20.3
Offsite Total	40.7	0.0	40.7
Total	40.9	0.0	40.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	0.965	0.097	0.97	0.10
Onsite Total						0.97	0.10
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.38	0.00
Total						1.35	0.10

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	35	9.94E-04	2.07E-04	0.03	0.01
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.03	0.01

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	32.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	32.8
Total	0.70	3.43	3.10	0.02	0.41	0.12	95.6

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	128	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.51	2.12	2.39	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	62.7	0.0	62.8
Total	62.7	0.0	62.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	128	N/A	30
40' Flat Bed Pole Truck	1	128	N/A	30
Worker Commute	4	128	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
40' Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
40' Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	10.0	0.0	10.0
40' Flat Bed Pole Truck	7.3	0.0	7.3
Worker Commute	15.5	0.0	15.5
Offsite Total	32.8	0.0	32.8
Total	32.8	0.0	32.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
40' Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Offsite Motor Vehicle Exhaust	0.73	5.39	2.11	0.02	0.20	0.14	83.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.15	0.00	
Offsite Total	0.73	5.39	2.11	0.02	1.36	0.14	83.2
Total	5.07	29.37	24.43	0.15	2.08	0.80	541.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	4	89	8
Boom/Crane Truck	350	2	89	8
Splicing Rig	350	1	20	2
3 Drum Straw Line Puller	300	1	45	6
Static Truck/Tensioner	350	1	45	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Splicing Rig	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Line Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	1.86	11.87	11.71	0.07	0.35	0.32
Boom/Crane Truck	1.37	5.66	6.36	0.03	0.23	0.21
Splicing Rig	0.16	0.92	0.61	0.00	0.02	0.02
3 Drum Straw Line Puller	0.48	2.76	1.82	0.01	0.06	0.05
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
Total	4.34	23.98	22.32	0.13	0.72	0.66

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	275.0	0.0	275.1
Boom/Crane Truck	116.3	0.0	116.4
Splicing Rig	4.6	0.0	4.6
3 Drum Straw Line Puller	31.1	0.0	31.2
Static Truck/Tensioner	31.1	0.0	31.2
Total	458.2	0.0	458.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	89	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	3	89	N/A	30
Wire Truck/Trailer	2	60	N/A	30
Dump Truck	1	89	N/A	30
Worker Commute	20	89	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.08	0.54	0.55	0.00	0.03	0.02
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.73	5.39	2.11	0.02	0.20	0.14
Total	0.73	5.39	2.11	0.02	0.20	0.14

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	7.0	0.0	7.0
1-Ton Crew Cab Flat Bed, 4x4	10.5	0.0	10.5
Wire Truck/Trailer	6.9	0.0	6.9
Dump Truck	5.1	0.0	5.1
Worker Commute	53.8	0.0	53.8
Offsite Total	83.2	0.0	83.2
Total	83.2	0.0	83.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	3	Paved	30	0.001	0.000	0.07	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						1.15	0.00
Total						1.15	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.92	12.58	7.81	0.05	0.29	0.27	10.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.42	0.09	
Onsite Total	1.92	12.58	7.81	0.05	0.71	0.36	10.0
Offsite Motor Vehicle Exhaust	0.70	5.00	2.80	0.02	0.23	0.17	5.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.10	0.00	
Offsite Total	0.70	5.00	2.80	0.02	1.34	0.17	5.3
Total	2.63	17.58	10.62	0.07	2.05	0.52	15.3

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	250	1	5	10
Crane (L)	500	1	5	10
Backhoe/Front Loader	125	1	5	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators
Crane (L)	500	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.65	3.21	2.22	0.02	0.07	0.07
Crane (L)	0.86	3.54	3.98	0.02	0.15	0.13
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Total	1.92	12.58	7.81	0.05	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	3.6	0.0	3.6
Crane (L)	4.1	0.0	4.1
Backhoe/Front Loader	2.3	0.0	2.3
Total	10.0	0.0	10.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	5	N/A	50
Water Truck	1	5	N/A	25
Concrete Mixer Truck	3	5	N/A	25
Dump Truck	3	5	N/A	25
Lowboy Truck/Trailer	1	5	N/A	25
Flat Bed Truck/Trailer	3	5	N/A	25
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

1-Ton Crew Cab, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.06	0.32	0.70	0.00	0.04	0.03
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.70	5.00	2.80	0.02	0.23	0.17
Total	0.70	5.00	2.80	0.02	0.23	0.17

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.2	0.0	0.2
Concrete Mixer Truck	0.7	0.0	0.7
Dump Truck	0.7	0.0	0.7
Lowboy Truck/Trailer	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.7	0.0	0.7
Worker Commute	2.5	0.0	2.5
Offsite Total	5.3	0.0	5.3
Total	5.3	0.0	5.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Flat Bed Truck/Trailer	3	Paved	25	0.001	0.000	0.06	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.10	0.00
Total						1.10	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	49.28	9.94E-04	2.07E-04	0.05	0.01

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.017	22.0	4.58	0.37	0.08
Total					0.42	0.09

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling volume based on a vault size of approximately 24 feet long, 14 feet wide, 12 feet deep. Approximately 0.33 vaults built per day. 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day

Storage pile size based on a 1 vault volume of 4032 cubic feet of soil. Storage pile assumed maximum 48 feet long, 14 feet wide, 6 feet high. 48 feet x 14 feet = 720 square feet = 0.017 acres

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.71	8.86	3.54	0.02	0.16	0.15	10.1
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.73	0.15	
Onsite Total	0.71	8.86	3.54	0.02	0.89	0.30	10.1
Offsite Motor Vehicle Exhaust	0.68	4.89	2.57	0.02	0.22	0.16	7.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.08	0.00	
Offsite Total	0.68	4.89	2.57	0.02	1.31	0.16	7.5
Total	1.39	13.75	6.11	0.04	2.20	0.46	17.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe/Front Loader	125	1	15	10
Compressor Trailer	60	1	15	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Compressor Trailer	0.29	3.02	1.93	0.01	0.09	0.08
Total	0.71	8.86	3.54	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe/Front Loader	6.9	0.0	6.9
Compressor Trailer	3.2	0.0	3.2
Total	10.1	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
Lowboy Truck/Trailer	1	15	N/A	25
1-Ton Truck, 4x4	2	15	N/A	50
Water Truck	1	15	N/A	25
Pipe Truck/Trailer	1	15	N/A	25
Concrete Mixer Truck	3	15	N/A	25
Dump Truck	3	15	N/A	25
Lowboy Truck/Trailer	1	1	N/A	25
Worker Commute	20	1	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Pipe Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Pipe Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.68	4.89	2.57	0.02	0.22	0.16
Total	0.68	4.89	2.57	0.02	0.22	0.16

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
Lowboy Truck/Trailer	0.7	0.0	0.7
1-Ton Truck, 4x4	0.8	0.0	0.8
Water Truck	0.5	0.0	0.5
Pipe Truck/Trailer	0.7	0.0	0.7
Concrete Mixer Truck	2.1	0.0	2.1
Dump Truck	2.1	0.0	2.1
Lowboy Truck/Trailer	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	7.5	0.0	7.5
Total	7.5	0.0	7.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/ Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Pipe Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.08	0.00
Total						1.08	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	92.28	9.94E-04	2.07E-04	0.09	0.02
Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.029	22.0	4.58	0.64	0.13
Total					0.73	0.15

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling cubic yards/day based on approximately 250 feet of trenching per day, 24 inches wide x 60 inches deep. 83 yards x 0.867 yards x 1.667 yards = 92.28 cubic yards/day

Storage pile acres based on approximately 250 feet of trenching per day, 60 inches wide x 24 inches high. 83 yards x 1.667 yards = 138.361 square yards = 0.029 acres

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Offsite Motor Vehicle Exhaust	0.53	4.03	0.88	0.01	0.14	0.09	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.93	0.00	
Offsite Total	0.53	4.03	0.88	0.01	1.06	0.09	3.3
Total	3.51	19.09	13.63	0.09	1.50	0.50	94.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	25	10
Manlift/Bucket Truck	250	1	25	10
Puller	350	1	25	10
Static Truck/Tensioner	350	1	25	10

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Manlift/Bucket Truck	250	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Puller	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.86	3.54	3.98	0.02	0.15	0.13
Manlift/Bucket Truck	0.54	2.32	2.71	0.01	0.09	0.09
Puller	0.79	4.61	3.03	0.02	0.10	0.09
Static Truck/Tensioner	0.79	4.61	3.03	0.02	0.10	0.09
Total	2.99	15.06	12.75	0.08	0.44	0.40

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	20.4	0.0	20.4
Manlift/Bucket Truck	12.7	0.0	12.7
Puller	28.8	0.0	28.8
Static Truck/Tensioner	28.8	0.0	28.8
Total	90.8	0.0	90.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/ Veh.
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	5	N/A	50
Wire Truck/Trailer	2	5	N/A	30
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.53	4.03	0.88	0.01	0.14	0.09
Total	0.53	4.03	0.88	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.3	0.0	0.3
Wire Truck/Trailer	0.6	0.0	0.6
Worker Commute	2.5	0.0	2.5
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^b Emission factors are in Table 54 and Table 55

^c CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						0.93	0.00
Total						0.93	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	5.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	5.7
Total	1.50	9.66	7.71	0.04	0.69	0.29	29.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	2	18	6
Boom/Crane Truck	350	1	18	8
Bucket Truck	250	1	18	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.35	3.63	2.31	0.01	0.11	0.10
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.27	7.94	6.96	0.03	0.27	0.25

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	4.6	0.0	4.6
Boom/Crane Truck	11.8	0.0	11.8
Bucket Truck	7.0	0.0	7.0
Total	23.3	0.0	23.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	1	18	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	18	N/A	30
Extendable Flat Bed Pole Truck	1	18	N/A	30
Worker Commute	6	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.7	0.0	0.7
1-Ton Crew Cab Flat Bed, 4x4	0.7	0.0	0.7
Extendable Flat Bed Pole Truck	1.0	0.0	1.0
Worker Commute	3.3	0.0	3.3
Offsite Total	5.7	0.0	5.7
Total	5.7	0.0	5.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.96	7.91	4.75	0.02	0.20	0.19	16.3
Onsite Motor Vehicle Exhaust	0.00	0.01	0.03	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	2.90	0.29	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.96	7.93	4.78	0.02	3.10	0.48	16.4
Offsite Motor Vehicle Exhaust	0.26	1.93	0.77	0.01	0.07	0.05	6.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.41	0.00	
Offsite Total	0.26	1.93	0.77	0.01	0.48	0.05	6.3
Total	1.22	9.85	5.55	0.03	3.58	0.53	22.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	18	6
Backhoe/Front Loader	125	1	18	6
Drum Type Compactor	100	1	18	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.96	7.91	4.75	0.02	0.20	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	8.4	0.0	8.4
Backhoe/Front Loader	5.0	0.0	5.0
Drum Type Compactor	2.9	0.0	2.9
Total	16.3	0.0	16.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	18	8	3
Offsite				
1-Ton Crew Cab, 4x4	2	18	N/A	30
Lowboy Truck/Trailer	1	18	N/A	30
Worker Commute	7	18	N/A	60

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.01	0.03	0.00	0.00	0.00
Onsite Total	0.00	0.01	0.03	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.26	1.93	0.77	0.01	0.07	0.05
Total	0.26	1.94	0.80	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Lowboy Truck/Trailer	1.0	0.0	1.0
Worker Commute	3.8	0.0	3.8
Offsite Total	6.2	0.0	6.3
Total	6.4	0.0	6.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	3	0.965	0.097	2.90	0.29
Onsite Total						2.90	0.29
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.41	0.00
Total						3.30	0.29

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 45
Telecommunications Construction
Tower Foundation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.53	6.74	3.59	0.01	0.11	0.10	2.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.50	0.10	
Onsite Total	0.53	6.74	3.59	0.01	0.61	0.21	2.4
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	1.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	1.3
Total	0.71	8.05	4.31	0.02	0.93	0.25	3.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	5	8
Concrete Mixer	120	1	5	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Concrete Mixer	120	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Concrete Mixer	0.30	4.04	2.18	0.01	0.07	0.06
Total	0.53	6.74	3.59	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	0.9	0.0	0.9
Concrete Mixer	1.5	0.0	1.5
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	5	N/A	30
Stake Truck	1	5	N/A	30
Worker Commute	4	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

**Table 45
Telecommunications Construction
Tower Foundation**

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Stake Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Stake Truck	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	1.3	0.0	1.3
Total	1.3	0.0	1.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Stake Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.50	0.10

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

**Table 46
Telecommunications Construction
Tower Construction**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Offsite Motor Vehicle Exhaust	0.16	1.18	0.44	0.00	0.04	0.03	6.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.24	0.00	
Offsite Total	0.16	1.18	0.44	0.00	0.28	0.03	6.0
Total	0.99	5.82	4.82	0.02	0.45	0.18	29.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Crane	300	1	30	8
150-Foot Lift Truck	100	1	30	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Crane	300	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Crane	0.69	2.83	3.18	0.01	0.12	0.11
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.83	4.64	4.38	0.02	0.17	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Crane	19.6	0.0	19.6
150-Foot Lift Truck	4.1	0.0	4.1
Total	23.8	0.0	23.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	30	N/A	30
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 46
Telecommunications Construction
Tower Construction

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.16	1.18	0.44	0.00	0.04	0.03
Total	0.16	1.18	0.44	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	2.4	0.0	2.4
Worker Commute	3.6	0.0	3.6
Offsite Total	6.0	0.0	6.0
Total	6.0	0.0	6.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.24	0.00
Total						0.24	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 47
Telecommunications Construction
Dish Installation**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	1.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	1.6
Total	0.27	2.81	1.45	0.01	0.30	0.07	3.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Lift Truck	100	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.14	1.81	1.20	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Lift Truck	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	10	N/A	30
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

**Table 47
Telecommunications Construction
Dish Installation**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.6	0.0	1.6
Total	1.6	0.0	1.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 48
Telecommunications Construction
Control Building**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Offsite Motor Vehicle Exhaust	0.08	0.59	0.22	0.00	0.02	0.01	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.12	0.00	
Offsite Total	0.08	0.59	0.22	0.00	0.14	0.01	2.5
Total	0.54	3.56	3.15	0.02	0.23	0.09	21.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	25	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	19.3	0.0	19.3
Total	19.3	0.0	19.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	25	N/A	30
Worker Commute	2	25	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 48
Telecommunications Construction
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.59	0.22	0.00	0.02	0.01
Total	0.08	0.59	0.22	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	1.0	0.0	1.0
Worker Commute	1.5	0.0	1.5
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.12	0.00
Total						0.12	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 49
Telecommunications Construction
Overhead Communications Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	5.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	5.0
Total	0.60	3.97	3.18	0.02	0.33	0.10	28.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	31	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	23.9	0.0	24.0
Total	23.9	0.0	24.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Reel Truck	1	31	N/A	30
Worker Commute	4	31	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Reel Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 49
Telecommunications Construction
Overhead Communications Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Reel Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Reel Truck	1.2	0.0	1.2
Worker Commute	3.7	0.0	3.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Reel Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.08	0.62	0.05	0.00	0.02	0.01	0.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.14	0.00	
Offsite Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9
Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

a From Table 53

b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Van	2	10	N/A	30
Worker Commute	2	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Van	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Van	0.03	0.21	0.02	0.00	0.01	0.00
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.62	0.05	0.00	0.02	0.01
Total	0.08	0.62	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Van	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	0.9	0.0	0.9
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Van	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.14	0.00
Total						0.14	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.32	1.84	1.21	0.01	0.04	0.04	13.8
Onsite Motor Vehicle Exhaust	0.03	0.21	0.22	0.00	0.01	0.01	1.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	15.93	1.59	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.35	2.05	1.43	0.01	15.98	1.64	15.2
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	3.6
Total	0.45	2.87	1.50	0.01	16.20	1.65	18.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
1-Ton Truck	300	1	30	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
1-Ton Truck	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
1-Ton Truck	0.32	1.84	1.21	0.01	0.04	0.04
Total	0.32	1.84	1.21	0.01	0.04	0.04

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
1-Ton Truck	13.8	0.0	13.8
Total	13.8	0.0	13.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Truck, 4x4	3	30	4	10
Van	1	30	2	5
Offsite				
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Van	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Van	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.03	0.21	0.22	0.00	0.01	0.01
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.14	1.03	0.28	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Truck, 4x4	1.2	0.0	1.2
Van	0.2	0.0	0.2
Onsite Total	1.4	0.0	1.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Truck, 4x4	3	Unpaved	10	0.455	0.046	13.66	1.37
Van	1	Unpaved	5	0.455	0.046	2.28	0.23
Onsite Total						15.93	1.59
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						16.12	1.59

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 51b

Additional Substation Construction Emissions
Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO ₂ e (MT)
Construction Equipment Exhaust	0.78	9.91	3.89	0.02	0.14	0.12	7.4
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	4.83	0.48	
Earthwork Fugitive PM	--	--	--	--	0.02	0.00	
Onsite Total	0.78	9.93	3.94	0.02	4.99	0.61	7.5
Offsite Motor Vehicle Exhaust	0.38	2.47	2.36	0.01	0.16	0.11	4.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.38	2.47	2.36	0.01	0.49	0.11	4.4
Total	1.16	12.41	6.30	0.03	5.48	0.73	11.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator with Auger Attachment	152	1	10	8
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4
Forklift	83	1	10	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO ₂ (lb/hr) ^a	CH ₄ (lb/hr) ^a	Category
Excavator with Auger Attachment	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator with Auger Attachment	0.41	5.31	1.59	0.01	0.07	0.07
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.78	9.91	3.89	0.02	0.14	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO ₂ (MT) ^a	CH ₄ (MT) ^a	CO ₂ e (MT) ^b
Excavator with Auger Attachment	4.1	0.0	4.1
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Forklift	0.0	0.0	0.0
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	4	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO ₂ (lb/mi) ^a	CH ₄ (lb/mi) ^a
Onsite									

Table 51b

Additional Substation Construction Emissions

Civil

Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Offsite										
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05	

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.19	1.03	2.24	0.01	0.12	0.09
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.38	2.47	2.36	0.01	0.16	0.11
Total	0.38	2.50	2.41	0.01	0.16	0.12

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	2.3	0.0	2.3
Worker Commute	2.1	0.0	2.1
Offsite Total	4.4	0.0	4.4
Total	4.5	0.0	4.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	0.965	0.097	2.41	0.24
Water Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Onsite Total						4.83	0.48
Offsite							
Concrete Truck	4	Paved	60	0.001	0.000	0.19	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						5.16	0.48

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	24	9.94E-04	2.07E-04	0.02	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.02	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated at 24 CY

Table 51c
Additional Substation Construction Emissions
Electrical

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.14	11.25	7.51	0.02	0.29	0.27	15.5
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.01	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	11.27	7.51	0.02	0.30	0.27	15.6
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	1.41	13.32	7.68	0.03	0.84	0.31	24.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	4	30	7
Reach Manlift	87	2	30	6
15-Ton Crane	125	2	5	5

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.47	3.78	3.41	0.01	0.10	0.09
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.46	4.74	2.30	0.01	0.12	0.11
Total	1.14	11.25	7.51	0.02	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	7.5	0.0	7.5
Reach Manlift	6.2	0.0	6.2
15-Ton Crane	1.8	0.0	1.8
Total	15.5	0.0	15.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	10	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 51c
Additional Substation Construction Emissions
Electrical

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.08	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.2	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	10	Paved	0.625	0.001	0.000	0.01	0.00
Onsite Total						0.01	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.49	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51d

Additional Substation Construction Emissions
Wiring

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.17	1.90	1.38	0.00	0.05	0.05	3.6
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.17	1.92	1.39	0.00	0.06	0.05	3.7
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	0.44	3.97	1.56	0.01	0.59	0.09	12.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Reach Manlift	87	2	30	3
Manlift	43	1	15	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

<http://www.aqmd.gov/ceqa/handbook/PM2.5/PM2.5.html>

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Reach Manlift	0.11	1.36	0.90	0.00	0.04	0.03
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.17	1.90	1.38	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Reach Manlift	3.1	0.0	3.1
Manlift	0.5	0.0	0.5
Total	3.6	0.0	3.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	8	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51d
Additional Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.07	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.1	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	8	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51e

Additional Substation Construction Emissions

Testing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	2.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	2.4
Total	0.11	0.83	0.07	0.00	0.22	0.02	2.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	20	0.25	0.625
Offsite				
Worker Commute	4	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51e
Additional Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.83	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	2.4	0.0	2.4
Offsite Total	2.4	0.0	2.4
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						0.19	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	3.77	1.90	0.01	0.05	0.05	3.3
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	4.83	0.48	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	0.30	3.79	1.95	0.01	5.02	0.56	3.4
Offsite Motor Vehicle Exhaust	0.28	1.96	1.24	0.01	0.10	0.07	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.28	1.96	1.24	0.01	0.44	0.07	3.3
Total	0.58	5.75	3.19	0.02	5.46	0.63	6.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Total	0.29	3.77	1.90	0.01	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	2	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed
^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.10	0.52	1.12	0.00	0.06	0.04
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.28	1.96	1.24	0.01	0.10	0.07
Total	0.28	1.98	1.29	0.01	0.10	0.07

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	1.1	0.0	1.1
Worker Commute	2.1	0.0	2.1
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	0.965	0.097	2.41	0.24
Water Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Onsite Total						4.83	0.48
Offsite							
Concrete Truck	2	Paved	60	0.001	0.000	0.10	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						5.16	0.48

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

Table 52
Operational Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT/yr)
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00	8
Motor Vehicle Exhaust	0.08	0.64	0.05	0.00	0.02	0.01	2
Motor Vehicle Fugitive PM	--	--	--	--	2.42	0.23	--
SF6 Leakage	--	--	--	--	--	--	660
Total	0.17	1.22	0.62	0.01	2.46	0.24	670

Emergency Diesel Generator Usage

Equipment	Horse-power	Number	Days Used/Year	Hours Used/Day
Emergency Diesel Generator	440	1	52	1

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Emergency Diesel Generator	440	0.086	0.582	0.570	0.003	0.017	0.000	336.853	0.008	Generator Sets

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Emergency Diesel Generator Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00
Total	0.09	0.58	0.57	0.00	0.02	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Emergency Diesel Generator Annual Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Emergency Diesel Generator	7.9	0.0	7.9
Total	7.9	0.0	7.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used/Year	Miles/Day/Veh.
Transmission Line Inspection	1	1	65
Subtransmission Line Inspection	1	1	62
Substation Site Visit	1	48	60

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Transmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Subtransmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Substation Site Visit	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Transmission Line Inspection	0.03	0.22	0.02	0.00	0.01	0.00
Subtransmission Line Inspection	0.03	0.21	0.02	0.00	0.01	0.00
Substation Site Visit	0.03	0.21	0.02	0.00	0.01	0.00
Total	0.08	0.64	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Annual Greenhouse Gas Emissions

Vehicle	CO2 (MT/yr) ^a	CH4 (MT/yr) ^a	CO2e (MT/yr) ^b
Transmission Line Inspection	0.0	0.0	0.0
Subtransmission Line Inspection	0.0	0.0	0.0
Substation Site Visit	1.5	0.0	1.5
Total	1.5	0.0	1.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 52
Operational Emissions

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Transmission Line Inspection	1	Paved	60	0.001	0.000	0.05	0.00
Transmission Line Inspection	1	Unpaved	5	0.455	0.046	2.28	0.23
Subtransmission Line Inspection	1	Paved	62	0.001	0.000	0.05	0.00
Substation Site Visit	1	Paved	60	0.001	0.000	0.05	0.00
Total						2.42	0.23

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

SF6 Leakage Greenhouse Gas Emissions

Item	Value	Units
SF6 in 500 kV Equipment	11,515	pounds
SF6 in 115 kV Equipment	1,257	pounds
Total SF6 Added	12,772	pounds
SF6 Leakage Rate	0.5	%/year
SF6 Emissions	63.86	pounds
SF6 Global Warming Potential ^a	22,800	
CO2e Emissions^b	660	MT/yr

^a Based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0,

April 2008.

http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

^b CO₂e emissions [metric tons] = SF₆ emissions [lb] x

Global warming potential [lb CO₂e/lb SF₆] x 453.6 [g/lb] /

1,000,000 [g/MT]

Substation	Item	SF6 Volume (Pounds Each)	Quantity Added	Total SF6 Volume (Pounds)
500 kV				
Alberhill	Circuit Breaker	1,645	7	11,515
500 kV Total				11,515
115 kV				
Alberhill	Circuit Breaker	83	15	1,245
Valley	Circuit Breaker	71	(1)	(71)
Newcomb	Circuit Breaker	83	1	83
115 kV Total				1,257
Total Change				12,772

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin	SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	Aerial Lifts	Aerial Lifts0000	0.0101	0.0528	0.0831	0.0001	0.0025	8.7	0.0009
	25	Aerial Lifts	Aerial Lifts0016	0.0132	0.0451	0.0838	0.0001	0.0032	11.0	0.0012
	50	Aerial Lifts	Aerial Lifts0026	0.0168	0.1351	0.1218	0.0003	0.0035	19.6	0.0015
	120	Aerial Lifts	Aerial Lifts0051	0.0176	0.2265	0.1496	0.0004	0.0063	38.1	0.0016
	500	Aerial Lifts	Aerial Lifts0121	0.0580	0.3710	0.3660	0.0021	0.0109	213	0.0052
	750	Aerial Lifts	Aerial Lifts0501	0.1054	0.6706	0.6753	0.0039	0.0199	385	0.0095
Aerial Lifts Composite		Aerial Lifts	Aerial Lifts0751	0.0184	0.1646	0.1366	0.0004	0.0048	34.7	0.0017
Air Compressors	15	Air Compressors	Air Compressors0000	0.0087	0.0444	0.0545	0.0001	0.0023	7.2	0.0008
	25	Air Compressors	Air Compressors0016	0.0181	0.0605	0.1121	0.0002	0.0045	14.4	0.0016
	50	Air Compressors	Air Compressors0026	0.0263	0.1911	0.1476	0.0003	0.0047	22.3	0.0024
	120	Air Compressors	Air Compressors0051	0.0289	0.3023	0.1928	0.0006	0.0088	47.0	0.0026
	175	Air Compressors	Air Compressors0121	0.0424	0.4998	0.2187	0.0010	0.0104	88.5	0.0038
	250	Air Compressors	Air Compressors0176	0.0514	0.2531	0.2553	0.0015	0.0078	131	0.0046
	500	Air Compressors	Air Compressors0251	0.0894	0.4292	0.4150	0.0023	0.0134	232	0.0081
	750	Air Compressors	Air Compressors0501	0.1385	0.6633	0.6545	0.0036	0.0210	358	0.0125
	1000	Air Compressors	Air Compressors0751	0.1999	0.9265	2.5439	0.0049	0.0483	486	0.0180
	Air Compressors Composite		Air Compressors	Air Compressors1001	0.0349	0.3027	0.2104	0.0007	0.0088	63.6
Bore/Drill Rigs	15	Bore/Drill Rigs	Bore/Drill Rigs0000	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	25	Bore/Drill Rigs	Bore/Drill Rigs0016	0.0193	0.0658	0.1219	0.0002	0.0046	16.0	0.0017
	50	Bore/Drill Rigs	Bore/Drill Rigs0026	0.0190	0.2200	0.1662	0.0004	0.0009	31.0	0.0017
	120	Bore/Drill Rigs	Bore/Drill Rigs0051	0.0252	0.4660	0.1955	0.0009	0.0020	77.1	0.0023
	175	Bore/Drill Rigs	Bore/Drill Rigs0121	0.0324	0.7542	0.0787	0.0016	0.0030	141	0.0029
	250	Bore/Drill Rigs	Bore/Drill Rigs0176	0.0427	0.3426	0.0981	0.0021	0.0035	188	0.0039
	500	Bore/Drill Rigs	Bore/Drill Rigs0251	0.0706	0.6512	0.1622	0.0031	0.0058	311	0.0064
	750	Bore/Drill Rigs	Bore/Drill Rigs0501	0.1396	1.0891	0.3204	0.0062	0.0115	615	0.0126
	1000	Bore/Drill Rigs	Bore/Drill Rigs0751	0.2115	1.6437	3.8912	0.0093	0.0364	928	0.0191
Bore/Drill Rigs Composite		Bore/Drill Rigs	Bore/Drill Rigs1001	0.0428	0.5007	0.2864	0.0017	0.0042	165	0.0039
Cement and Mortar Mixers	15	Cement and Mortar Mixers	Cement and Mortar Mixers0000	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	Cement and Mortar Mixers	Cement and Mortar Mixers0016	0.0213	0.0724	0.1346	0.0002	0.0052	17.6	0.0019
Cement and Mortar Mixers Composite		Cement and Mortar Mixers	Cement and Mortar Mixers0026	0.0085	0.0414	0.0534	0.0001	0.0021	7.2	0.0008
Concrete/Industrial Saws	25	Concrete/Industrial Saws	Concrete/Industrial Saws0000	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018
	50	Concrete/Industrial Saws	Concrete/Industrial Saws0026	0.0279	0.2284	0.1910	0.0004	0.0053	30.2	0.0025
	120	Concrete/Industrial Saws	Concrete/Industrial Saws0051	0.0370	0.4561	0.2840	0.0009	0.0117	74.1	0.0033
	175	Concrete/Industrial Saws	Concrete/Industrial Saws0121	0.0623	0.8663	0.3523	0.0018	0.0160	160	0.0056
Concrete/Industrial Saws Composite		Concrete/Industrial Saws	Concrete/Industrial Saws0176	0.0337	0.3706	0.2471	0.0007	0.0093	58.5	0.0030
Cranes	50	Cranes	Cranes0000	0.0350	0.2256	0.1644	0.0003	0.0062	23.2	0.0032
	120	Cranes	Cranes0051	0.0376	0.3384	0.2298	0.0006	0.0120	50.1	0.0034
	175	Cranes	Cranes0121	0.0462	0.4744	0.2300	0.0009	0.0120	80.3	0.0042
	250	Cranes	Cranes0176	0.0544	0.2316	0.2705	0.0013	0.0094	112	0.0049
	500	Cranes	Cranes0251	0.0858	0.3535	0.3977	0.0018	0.0146	180	0.0077
	750	Cranes	Cranes0501	0.1446	0.5947	0.6821	0.0030	0.0248	303	0.0130
	9999	Cranes	Cranes0751	0.5219	1.9715	5.5760	0.0098	0.1146	971	0.0471
Cranes Composite		Cranes	Cranes1000	0.0681	0.3738	0.4223	0.0014	0.0143	129	0.0061
Crawler Tractors	50	Crawler Tractors	Crawler Tractors0000	0.0487	0.2566	0.1842	0.0003	0.0090	24.9	0.0044
	120	Crawler Tractors	Crawler Tractors0051	0.0609	0.4537	0.3562	0.0008	0.0221	65.8	0.0055
	175	Crawler Tractors	Crawler Tractors0121	0.0823	0.7265	0.4447	0.0014	0.0241	121	0.0074
	250	Crawler Tractors	Crawler Tractors0176	0.0924	0.3662	0.5348	0.0019	0.0192	166	0.0083
	500	Crawler Tractors	Crawler Tractors0251	0.1392	0.5877	0.7527	0.0025	0.0280	259	0.0126
	750	Crawler Tractors	Crawler Tractors0501	0.2506	1.0528	1.3878	0.0047	0.0510	465	0.0226
	1000	Crawler Tractors	Crawler Tractors0751	0.3749	1.5618	4.2168	0.0066	0.0656	658	0.0338
Crawler Tractors Composite		Crawler Tractors	Crawler Tractors1001	0.0789	0.5065	0.4482	0.0013	0.0227	114	0.0071

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin		SC								
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Crushing/Proc. Equipment	50	Crushing/Proc. Equipment	Crushing/Proc. Equipment000	0.0508	0.3859	0.2899	0.0006	0.0083	44.0	0.0046
	120	Crushing/Proc. Equipment	Crushing/Proc. Equipment0051	0.0506	0.5406	0.3289	0.0010	0.0140	83.1	0.0046
	175	Crushing/Proc. Equipment	Crushing/Proc. Equipment0121	0.0795	0.9556	0.3830	0.0019	0.0177	167	0.0072
	250	Crushing/Proc. Equipment	Crushing/Proc. Equipment0176	0.0967	0.4768	0.4357	0.0028	0.0134	245	0.0087
	500	Crushing/Proc. Equipment	Crushing/Proc. Equipment0251	0.1459	0.6977	0.6163	0.0037	0.0200	374	0.0132
	750	Crushing/Proc. Equipment	Crushing/Proc. Equipment0501	0.2307	1.1003	0.9907	0.0059	0.0316	589	0.0208
	9999	Crushing/Proc. Equipment	Crushing/Proc. Equipment0751	0.6019	2.5014	6.6977	0.0131	0.1238	1,308	0.0543
Crushing/Proc. Equipment Composite		Crushing/Proc. Equipment	Crushing/Proc. Equipment10000	0.0693	0.6187	0.3763	0.0015	0.0146	132	0.0062
Dumpers/Tenders	25	Dumpers/Tenders	Dumpers/Tenders0000	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Dumpers/Tenders Composite		Dumpers/Tenders	Dumpers/Tenders0026	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Excavators	25	Excavators	Excavators0000	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018
	50	Excavators	Excavators0026	0.0297	0.2365	0.1616	0.0003	0.0035	25.0	0.0027
	120	Excavators	Excavators0051	0.0448	0.4942	0.2638	0.0009	0.0092	73.6	0.0040
	175	Excavators	Excavators0121	0.0518	0.6636	0.1982	0.0013	0.0091	112	0.0047
	250	Excavators	Excavators0176	0.0647	0.3210	0.2222	0.0018	0.0074	159	0.0058
	500	Excavators	Excavators0251	0.0946	0.4495	0.3091	0.0023	0.0107	234	0.0085
	750	Excavators	Excavators0501	0.1569	0.7451	0.5194	0.0039	0.0178	387	0.0142
Excavators Composite		Excavators	Excavators0056	0.0559	0.5086	0.2269	0.0013	0.0086	120	0.0050
Forklifts	50	Forklifts	Forklifts0000	0.0150	0.1361	0.0904	0.0002	0.0013	14.7	0.0014
	120	Forklifts	Forklifts0051	0.0168	0.2086	0.0997	0.0004	0.0023	31.2	0.0015
	175	Forklifts	Forklifts0121	0.0228	0.3310	0.0732	0.0006	0.0029	56.1	0.0021
	250	Forklifts	Forklifts0176	0.0289	0.1551	0.0746	0.0009	0.0027	77.1	0.0026
	500	Forklifts	Forklifts0251	0.0416	0.2123	0.1038	0.0011	0.0038	111	0.0038
Forklifts Composite		Forklifts	Forklifts0501	0.0236	0.2148	0.0860	0.0006	0.0025	54.4	0.0021
Generator Sets	15	Generator Sets	Generator Sets0000	0.0109	0.0627	0.0768	0.0002	0.0032	10.2	0.0010
	25	Generator Sets	Generator Sets0016	0.0216	0.0738	0.1368	0.0002	0.0055	17.6	0.0019
	50	Generator Sets	Generator Sets0026	0.0242	0.2034	0.1881	0.0004	0.0051	30.6	0.0022
	120	Generator Sets	Generator Sets0051	0.0340	0.4585	0.3022	0.0009	0.0122	77.9	0.0031
	175	Generator Sets	Generator Sets0121	0.0469	0.7328	0.3291	0.0016	0.0136	142	0.0042
	250	Generator Sets	Generator Sets0176	0.0558	0.3746	0.3885	0.0024	0.0108	213	0.0050
	500	Generator Sets	Generator Sets0251	0.0862	0.5820	0.5697	0.0033	0.0167	337	0.0078
	750	Generator Sets	Generator Sets0501	0.1401	0.9395	0.9382	0.0055	0.0272	544	0.0126
Generator Sets Composite		Generator Sets	Generator Sets10000	0.0288	1.8648	5.2188	0.0105	0.0888	1,049	0.0292
Graders	50	Graders	Graders0000	0.0382	0.2599	0.1877	0.0004	0.0063	27.5	0.0034
	120	Graders	Graders0051	0.0521	0.5009	0.3219	0.0009	0.0153	75.0	0.0047
	175	Graders	Graders0121	0.0652	0.7261	0.3117	0.0014	0.0157	124	0.0059
	250	Graders	Graders0176	0.0781	0.3549	0.3652	0.0019	0.0129	172	0.0071
	500	Graders	Graders0251	0.1023	0.4610	0.4468	0.0023	0.0165	229	0.0092
	750	Graders	Graders0501	0.2167	0.9755	0.9628	0.0049	0.0353	486	0.0196
Graders Composite		Graders	Graders0751	0.0676	0.5696	0.3314	0.0015	0.0147	133	0.0061
Off-Highway Tractors	120	Off-Highway Tractors	Off-Highway Tractors0000	0.1108	0.6619	0.6362	0.0011	0.0455	93.7	0.0100
	175	Off-Highway Tractors	Off-Highway Tractors0121	0.1110	0.7932	0.6639	0.0015	0.0370	130	0.0100
	250	Off-Highway Tractors	Off-Highway Tractors0176	0.0890	0.3179	0.5983	0.0015	0.0227	130	0.0090
	750	Off-Highway Tractors	Off-Highway Tractors0251	0.3692	1.5358	2.4157	0.0057	0.0918	568	0.0333
	1000	Off-Highway Tractors	Off-Highway Tractors0751	0.5623	2.3619	6.0896	0.0082	0.1577	814	0.0507
Off-Highway Tractors Composite		Off-Highway Tractors	Off-Highway Tractors1001	0.1134	0.6101	0.7291	0.0017	0.0331	151	0.0102
Off-Highway Trucks	175	Off-Highway Trucks	Off-Highway Trucks0000	0.0622	0.7536	0.2376	0.0014	0.0112	125	0.0056
	250	Off-Highway Trucks	Off-Highway Trucks0176	0.0730	0.3435	0.2521	0.0019	0.0085	167	0.0066
	500	Off-Highway Trucks	Off-Highway Trucks0251	0.1183	0.5319	0.3878	0.0027	0.0135	272	0.0107
	750	Off-Highway Trucks	Off-Highway Trucks0501	0.1921	0.8627	0.6384	0.0044	0.0221	442	0.0173
	1000	Off-Highway Trucks	Off-Highway Trucks0751	0.2823	1.2403	3.1782	0.0063	0.0546	625	0.0255
Off-Highway Trucks Composite		Off-Highway Trucks	Off-Highway Trucks1001	0.1140	0.5385	0.4769	0.0027	0.0142	260	0.0103

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025				(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Air Basin	SC			COG	CO	NOX	SOX	PM	CO2	CH4
Equipment	MaxHP									
Other Construction Equipment	15	Other Construction Equipment	Other Construction Equipment000	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
	25	Other Construction Equipment	Other Construction Equipment0016	0.0159	0.0544	0.1008	0.0002	0.0038	13.2	0.0014
	50	Other Construction Equipment	Other Construction Equipment0026	0.0244	0.2188	0.1893	0.0004	0.0034	28.0	0.0022
	120	Other Construction Equipment	Other Construction Equipment0051	0.0379	0.5045	0.2730	0.0009	0.0087	80.9	0.0034
	175	Other Construction Equipment	Other Construction Equipment0121	0.0384	0.5858	0.1729	0.0012	0.0075	107	0.0035
500	Other Construction Equipment	Other Construction Equipment0176	0.0792	0.4606	0.3034	0.0025	0.0099	254	0.0071	
Other Construction Equipment Composite		Other Construction Equipment	Other Construction Equipment0501	0.0442	0.3474	0.2021	0.0013	0.0069	123	0.0040
Other General Industrial Equipmen	15	Other General Industrial Equipmen	Other General Industrial Equipmen0000	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
	25	Other General Industrial Equipmen	Other General Industrial Equipmen0016	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017
	50	Other General Industrial Equipmen	Other General Industrial Equipmen0026	0.0298	0.2099	0.1491	0.0003	0.0047	21.7	0.0027
	120	Other General Industrial Equipmen	Other General Industrial Equipmen0051	0.0436	0.4189	0.2803	0.0007	0.0120	62.0	0.0039
	175	Other General Industrial Equipmen	Other General Industrial Equipmen0121	0.0519	0.5684	0.2412	0.0011	0.0115	95.9	0.0047
	250	Other General Industrial Equipmen	Other General Industrial Equipmen0176	0.0608	0.2743	0.2679	0.0015	0.0083	136	0.0055
	500	Other General Industrial Equipmen	Other General Industrial Equipmen0251	0.1174	0.5103	0.4826	0.0026	0.0157	265	0.0106
	750	Other General Industrial Equipmen	Other General Industrial Equipmen0501	0.1939	0.8411	0.8117	0.0044	0.0262	437	0.0175
	1000	Other General Industrial Equipmen	Other General Industrial Equipmen0751	0.2627	1.1060	2.9924	0.0056	0.0579	560	0.0237
	Other General Industrial Equipmen Composite		Other General Industrial Equipmen	Other General Industrial Equipmen1001	0.0747	0.4438	0.3947	0.0016	0.0130	152
Other Material Handling Equipment	50	Other Material Handling Equipment	Other Material Handling Equipment0000	0.0410	0.2893	0.2073	0.0004	0.0065	30.3	0.0037
	120	Other Material Handling Equipment	Other Material Handling Equipment0051	0.0421	0.4076	0.2541	0.0007	0.0117	60.7	0.0038
	175	Other Material Handling Equipment	Other Material Handling Equipment0121	0.0653	0.7197	0.3067	0.0014	0.0146	122	0.0059
	250	Other Material Handling Equipment	Other Material Handling Equipment0176	0.0642	0.2920	0.2863	0.0016	0.0088	145	0.0058
	500	Other Material Handling Equipment	Other Material Handling Equipment0251	0.0837	0.3670	0.3482	0.0019	0.0113	192	0.0075
9999	Other Material Handling Equipment	Other Material Handling Equipment0501	0.3781	1.4596	3.9555	0.0073	0.0764	741	0.0341	
Other Material Handling Equipment Composite		Other Material Handling Equipment	Other Material Handling Equipment1000	0.0696	0.4355	0.3844	0.0015	0.0124	141	0.0063
Pavers	25	Pavers	Pavers0000	0.0225	0.0768	0.1422	0.0002	0.0053	18.7	0.0020
	50	Pavers	Pavers0026	0.0574	0.2803	0.2102	0.0004	0.0114	28.0	0.0052
	120	Pavers	Pavers0051	0.0662	0.4696	0.4003	0.0008	0.0263	68.2	0.0060
	175	Pavers	Pavers0121	0.0899	0.7543	0.5238	0.0014	0.0286	128	0.0081
	250	Pavers	Pavers0176	0.1097	0.4287	0.7020	0.0022	0.0254	194	0.0099
500	Pavers	Pavers0251	0.1263	0.5374	0.7572	0.0023	0.0284	233	0.0114	
Pavers Composite		Pavers	Pavers0501	0.0717	0.4745	0.3858	0.0009	0.0220	77.9	0.0065
Paving Equipment	25	Paving Equipment	Paving Equipment0000	0.0152	0.0520	0.0963	0.0002	0.0036	12.6	0.0014
	50	Paving Equipment	Paving Equipment0026	0.0468	0.2355	0.1789	0.0003	0.0095	23.9	0.0042
	120	Paving Equipment	Paving Equipment0051	0.0503	0.3671	0.3092	0.0006	0.0200	54.5	0.0045
	175	Paving Equipment	Paving Equipment0121	0.0687	0.5900	0.4021	0.0011	0.0219	101	0.0062
250	Paving Equipment	Paving Equipment0176	0.0672	0.2648	0.4289	0.0014	0.0154	122	0.0061	
Paving Equipment Composite		Paving Equipment	Paving Equipment0251	0.0548	0.3993	0.3281	0.0008	0.0190	68.9	0.0049
Plate Compactors	15	Plate Compactors	Plate Compactors0000	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Plate Compactors Composite		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Pressure Washers	15	Pressure Washers	Pressure Washers0000	0.0052	0.0301	0.0368	0.0001	0.0015	4.9	0.0005
	25	Pressure Washers	Pressure Washers0016	0.0087	0.0299	0.0555	0.0001	0.0022	7.1	0.0008
	50	Pressure Washers	Pressure Washers0026	0.0079	0.0810	0.0843	0.0002	0.0019	14.3	0.0007
	120	Pressure Washers	Pressure Washers0051	0.0082	0.1351	0.0897	0.0003	0.0031	24.1	0.0007
Pressure Washers Composite		Pressure Washers	Pressure Washers0121	0.0066	0.0531	0.0561	0.0001	0.0019	9.4	0.0006
Pumps	15	Pumps	Pumps0000	0.0089	0.0456	0.0560	0.0001	0.0024	7.4	0.0008
	25	Pumps	Pumps0016	0.0244	0.0816	0.1512	0.0002	0.0061	19.5	0.0022
	50	Pumps	Pumps0026	0.0299	0.2394	0.2138	0.0004	0.0061	34.3	0.0027
	120	Pumps	Pumps0051	0.0365	0.4656	0.3062	0.0009	0.0129	77.9	0.0033
	175	Pumps	Pumps0121	0.0499	0.7342	0.3301	0.0016	0.0142	140	0.0045
	250	Pumps	Pumps0176	0.0572	0.3604	0.3745	0.0023	0.0107	201	0.0052
	500	Pumps	Pumps0251	0.0959	0.6034	0.5922	0.0034	0.0178	345	0.0087
	750	Pumps	Pumps0501	0.1593	0.9975	0.9991	0.0057	0.0297	571	0.0144
9999	Pumps	Pumps0751	0.4488	2.4388	6.8114	0.0136	0.1186	1,355	0.0405	

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025											
Air Basin		SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
				COG	CO	NOX	SOX	PM	CO2	CH4	
Pumps Composite		Pumps	Pumps10000	0.0270	0.2617	0.2079	0.0006	0.0078	49.6	0.0024	
Rollers	15	Rollers	Rollers0000	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007	
	25	Rollers	Rollers0016	0.0161	0.0549	0.1017	0.0002	0.0038	13.3	0.0015	
	50	Rollers	Rollers0026	0.0345	0.2258	0.1776	0.0003	0.0068	26.0	0.0031	
	120	Rollers	Rollers0051	0.0392	0.3801	0.2847	0.0007	0.0137	59.0	0.0035	
	175	Rollers	Rollers0121	0.0553	0.6096	0.3030	0.0012	0.0156	108	0.0050	
	250	Rollers	Rollers0176	0.0656	0.3037	0.3629	0.0017	0.0127	153	0.0059	
Rollers Composite	500	Rollers	Rollers0251	0.0920	0.4189	0.4752	0.0022	0.0174	219	0.0083	
		Rollers	Rollers0501	0.0410	0.3763	0.2501	0.0008	0.0122	67.0	0.0037	
Rough Terrain Forklifts	50	Rough Terrain Forklifts	Rough Terrain Forklifts0000	0.0381	0.3041	0.2193	0.0004	0.0054	33.9	0.0034	
	120	Rough Terrain Forklifts	Rough Terrain Forklifts0051	0.0369	0.4106	0.2316	0.0007	0.0087	62.4	0.0033	
	175	Rough Terrain Forklifts	Rough Terrain Forklifts0121	0.0569	0.7229	0.2450	0.0014	0.0112	125	0.0051	
	250	Rough Terrain Forklifts	Rough Terrain Forklifts0176	0.0671	0.3372	0.2625	0.0019	0.0084	171	0.0061	
	Rough Terrain Forklifts Composite	500	Rough Terrain Forklifts	Rough Terrain Forklifts0251	0.0999	0.4838	0.3682	0.0025	0.0123	257	0.0090
			Rough Terrain Forklifts	Rough Terrain Forklifts0501	0.0396	0.4430	0.2336	0.0008	0.0090	70.3	0.0036
Rubber Tired Dozers	175	Rubber Tired Dozers	Rubber Tired Dozers0000	0.1163	0.8019	0.6895	0.0015	0.0386	129	0.0105	
	250	Rubber Tired Dozers	Rubber Tired Dozers0176	0.1329	0.4624	0.8841	0.0021	0.0340	183	0.0120	
	500	Rubber Tired Dozers	Rubber Tired Dozers0251	0.1817	0.7490	1.1543	0.0026	0.0448	265	0.0164	
	750	Rubber Tired Dozers	Rubber Tired Dozers0501	0.2747	1.1262	1.7818	0.0040	0.0684	399	0.0248	
	Rubber Tired Dozers Composite	1000	Rubber Tired Dozers	Rubber Tired Dozers0751	0.4321	1.7954	4.5523	0.0060	0.1202	592	0.0390
			Rubber Tired Dozers	Rubber Tired Dozers1001	0.1672	0.6620	1.0824	0.0025	0.0419	239	0.0151
Rubber Tired Loaders	25	Rubber Tired Loaders	Rubber Tired Loaders0000	0.0204	0.0697	0.1291	0.0002	0.0048	16.9	0.0018	
	50	Rubber Tired Loaders	Rubber Tired Loaders0026	0.0418	0.2904	0.2109	0.0004	0.0069	31.1	0.0038	
	120	Rubber Tired Loaders	Rubber Tired Loaders0051	0.0397	0.3916	0.2476	0.0007	0.0115	58.9	0.0036	
	175	Rubber Tired Loaders	Rubber Tired Loaders0121	0.0546	0.6199	0.2592	0.0012	0.0130	106	0.0049	
	250	Rubber Tired Loaders	Rubber Tired Loaders0176	0.0661	0.3041	0.3040	0.0017	0.0107	149	0.0060	
	500	Rubber Tired Loaders	Rubber Tired Loaders0251	0.1034	0.4654	0.4455	0.0023	0.0164	237	0.0093	
	750	Rubber Tired Loaders	Rubber Tired Loaders0501	0.2119	0.9532	0.9273	0.0049	0.0338	486	0.0191	
	Rubber Tired Loaders Composite	1000	Rubber Tired Loaders	Rubber Tired Loaders0751	0.2701	1.1927	3.2272	0.0060	0.0615	594	0.0244
			Rubber Tired Loaders	Rubber Tired Loaders1001	0.0559	0.4311	0.2835	0.0012	0.0121	109	0.0050
	Scrapers	120	Scrapers	Scrapers0000	0.0887	0.6472	0.5218	0.0011	0.0330	93.9	0.0080
175		Scrapers	Scrapers0121	0.1025	0.8864	0.5654	0.0017	0.0307	148	0.0092	
250		Scrapers	Scrapers0176	0.1187	0.4642	0.7040	0.0024	0.0254	209	0.0107	
500		Scrapers	Scrapers0251	0.1755	0.7332	0.9727	0.0032	0.0364	321	0.0158	
Scrapers Composite		750	Scrapers	Scrapers0501	0.3043	1.2657	1.7266	0.0056	0.0638	555	0.0275
			Scrapers	Scrapers0751	0.1495	0.7187	0.8387	0.0027	0.0335	262	0.0135
Signal Boards	15	Signal Boards	Signal Boards0000	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006	
	50	Signal Boards	Signal Boards0016	0.0332	0.2686	0.2268	0.0005	0.0063	36.2	0.0030	
	120	Signal Boards	Signal Boards0051	0.0394	0.4898	0.3076	0.0009	0.0127	80.2	0.0036	
	175	Signal Boards	Signal Boards0121	0.0587	0.8292	0.3433	0.0017	0.0152	155	0.0053	
	250	Signal Boards	Signal Boards0176	0.0794	0.4676	0.4435	0.0029	0.0132	255	0.0072	
Signal Boards Composite		Signal Boards	Signal Boards0251	0.0111	0.9909	0.0718	0.0002	0.0029	16.7	0.0010	
Skid Steer Loaders	25	Skid Steer Loaders	Skid Steer Loaders0000	0.0167	0.0568	0.1055	0.0002	0.0040	13.8	0.0015	
	50	Skid Steer Loaders	Skid Steer Loaders0026	0.0194	0.1977	0.1446	0.0003	0.0015	25.5	0.0017	
	120	Skid Steer Loaders	Skid Steer Loaders0051	0.0175	0.2665	0.1240	0.0005	0.0022	42.8	0.0016	
Skid Steer Loaders Composite		Skid Steer Loaders	Skid Steer Loaders0121	0.0186	0.2104	0.1354	0.0004	0.0019	30.3	0.0017	
Surfacing Equipment	50	Surfacing Equipment	Surfacing Equipment0000	0.0171	0.1105	0.0934	0.0002	0.0035	14.1	0.0015	
	120	Surfacing Equipment	Surfacing Equipment0051	0.0385	0.3950	0.2869	0.0007	0.0146	63.8	0.0035	
	175	Surfacing Equipment	Surfacing Equipment0121	0.0386	0.4642	0.2429	0.0010	0.0119	85.8	0.0035	
	250	Surfacing Equipment	Surfacing Equipment0176	0.0504	0.2804	0.3275	0.0015	0.0111	135	0.0045	
	500	Surfacing Equipment	Surfacing Equipment0251	0.0800	0.4236	0.4893	0.0022	0.0174	221	0.0072	
	750	Surfacing Equipment	Surfacing Equipment0501	0.1260	0.6643	0.7833	0.0035	0.0275	347	0.0114	
Surfacing Equipment Composite		Surfacing Equipment	Surfacing Equipment0751	0.0638	0.3590	0.3924	0.0017	0.0142	166	0.0058	

Table 53
SCAB Fleet Average Emission Factors (Diesel)

		2025								
Air Basin		SC								
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Sweepers/Scrubbers	15	Sweepers/Scrubbers	Sweepers/Scrubbers000	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011
	25	Sweepers/Scrubbers	Sweepers/Scrubbers0016	0.0237	0.0808	0.1495	0.0002	0.0056	19.6	0.0021
	50	Sweepers/Scrubbers	Sweepers/Scrubbers0026	0.0308	0.2762	0.1942	0.0004	0.0033	31.6	0.0028
	120	Sweepers/Scrubbers	Sweepers/Scrubbers0051	0.0395	0.4895	0.2530	0.0009	0.0068	75.0	0.0036
	175	Sweepers/Scrubbers	Sweepers/Scrubbers0121	0.0565	0.8005	0.2201	0.0016	0.0084	139	0.0051
250	Sweepers/Scrubbers	Sweepers/Scrubbers0176	0.0587	0.3179	0.1898	0.0018	0.0062	162	0.0053	
Sweepers/Scrubbers Composite			Sweepers/Scrubbers	0.0410	0.4840	0.2255	0.0009	0.0061	78.5	0.0037
Tractors/Loaders/Backhoes	25	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0000	0.0191	0.0653	0.1209	0.0002	0.0045	15.9	0.0017
	50	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0026	0.0316	0.2678	0.1895	0.0004	0.0037	30.3	0.0029
	120	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0051	0.0281	0.3379	0.1761	0.0006	0.0055	51.7	0.0025
	175	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0121	0.0420	0.5839	0.1613	0.0011	0.0072	101	0.0038
	250	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0176	0.0633	0.3389	0.2157	0.0019	0.0073	172	0.0057
	500	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0251	0.1263	0.6506	0.4127	0.0039	0.0144	345	0.0114
	750	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0501	0.1896	0.9760	0.6256	0.0058	0.0216	517	0.0171
Tractors/Loaders/Backhoes Composite			Tractors/Loaders/Backhoes	0.0336	0.3586	0.1857	0.0008	0.0059	66.8	0.0030
Trenchers	15	Trenchers	Trenchers0000	0.0099	0.0517	0.0617	0.0001	0.0024	8.5	0.0009
	25	Trenchers	Trenchers0016	0.0397	0.1355	0.2509	0.0004	0.0094	32.9	0.0036
	50	Trenchers	Trenchers0026	0.0687	0.3197	0.2467	0.0004	0.0140	32.9	0.0062
	120	Trenchers	Trenchers0051	0.0625	0.4341	0.3863	0.0008	0.0259	64.9	0.0056
	175	Trenchers	Trenchers0121	0.1009	0.8327	0.6152	0.0016	0.0338	144	0.0091
	250	Trenchers	Trenchers0176	0.1247	0.4925	0.8480	0.0025	0.0309	223	0.0112
	500	Trenchers	Trenchers0251	0.1661	0.7370	1.0663	0.0031	0.0400	311	0.0150
	750	Trenchers	Trenchers0501	0.3147	1.3882	2.0666	0.0059	0.0766	587	0.0284
Trenchers Composite			Trenchers	0.0674	0.4085	0.3481	0.0007	0.0215	58.7	0.0061
Welders	15	Welders	Welders0000	0.0075	0.0381	0.0468	0.0001	0.0020	6.2	0.0007
	25	Welders	Welders0016	0.0141	0.0473	0.0876	0.0001	0.0035	11.3	0.0013
	50	Welders	Welders0026	0.0280	0.2077	0.1684	0.0003	0.0053	26.0	0.0025
	120	Welders	Welders0051	0.0223	0.2476	0.1601	0.0005	0.0073	39.5	0.0020
	175	Welders	Welders0121	0.0430	0.5400	0.2396	0.0011	0.0111	98.2	0.0039
	250	Welders	Welders0176	0.0423	0.2236	0.2294	0.0013	0.0069	119	0.0038
	500	Welders	Welders0251	0.0585	0.3040	0.2969	0.0016	0.0095	168	0.0053
Welders Composite			Welders	0.0214	0.1745	0.1373	0.0003	0.0052	25.6	0.0019

Source: File off-road-mobile-source-emission-factors-scenario-years-2007-2025).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>

Table 54
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories: **Passenger Vehicles & Delivery Trucks.**

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: 2025			
All model years in the range 1981 to 2025			
Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00342738	CO	0.00595363
NOx	0.00028846	NOx	0.00615945
ROG	0.00043545	ROG	0.00092178
SOx	0.00001070	SOx	0.00002761
PM10	0.00009679	PM10	0.00028425
PM2.5	0.00006418	PM2.5	0.00020958
CO2	1.11078571	CO2	2.88143570
CH4	0.00003641	CH4	0.00003765

Source: File on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/>

Table 55
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

$$\text{Emissions (pounds per day)} = N \times TL \times EF$$

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: 2025			
All model years in the range 1981 to 2025			
HHDT-DSL (pounds/mile)		HHDT-DSL, Exh (pounds/mile)	
CO	0.00431086	PM10	0.00034397
NOx	0.00932573	PM2.5	0.00031664
ROG	0.00080206		
SOx	0.00004018		
PM10	0.00048541		
PM2.5	0.00036326		
CO2	4.19512979		
CH4	0.00003697		

Source: File heavy-heavy-duty-on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from [http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-\(v2-3\)-emission-factors-\(on-road\)](http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-(v2-3)-emission-factors-(on-road))

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
1/2-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1/2-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
1-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
10-cu. yd. Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
10-cu. yd. Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
1-Ton Crew Cab Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
1-Ton Crew Cab, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
1-Ton Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
3/4-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
3/4-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
40' Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
40' Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Asphalt Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Asphalt Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Carry-all Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Carry-all Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Concrete Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Crew Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
Crew Vehicle	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Vehicle	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
Crewcab Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crewcab Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
Crushed Rock Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crushed Rock Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Dump Truck (Trash)	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck (Trash)	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Extendable Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Extendable Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Flat Bed Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flat Bed Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Flatbed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flatbed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Fuel, Helicopter Support Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Fuel, Helicopter Support Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Jet A Fuel Truck	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Jet A Fuel Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Low Bed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Low Bed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Lowboy Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Lowboy Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Maintenance Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
Maintenance Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	55%	7.60E-01	7.60E-02
Pipe Truck/Trailer	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Pipe Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Reel Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Reel Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	55%	7.60E-01	7.60E-02
Stake Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stake Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Stakebed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stakebed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Truck, Semi Tractor	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Truck, Semi Tractor	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Van	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Van	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Water Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Water Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Wire Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Wire Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Worker Commute	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Worker Commute	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02

^a Paved road silt loading from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997) for collector roads, <http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf>

Unpaved road silt content from SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden

^b Average paved on-road vehicle weight in Riverside County from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

Unpaved worker commuting weight on access road assumed to be same as paved road weight

Unpaved weight for other trucks is based on upper limit of 33,000 lbs for medium heavy-duty trucks.

^c Equations:

$EF(\text{paved}) = k_p (sL/2)^{0.65} (W/3)^{1.5} - C$

Ref: AP-42, Section 13.2.1, "Paved Rods," November 2006

$EF(\text{unpaved}) = k_u (s/12)^a (W/3)^b$

Ref: AP-42, Section 13.2.2, "Unpaved Rods," November 2006

Constants:

$k_p =$	0.016	(Particle size multiplier for PM10)
	0.0024	(Particle size multiplier for PM2.5)
$C =$	0.00047	(Exhaust, brake wear and tire wear adjustment, PM10)
	0.00036	(Exhaust, brake wear and tire wear adjustment, PM2.5)
$k_u =$	1.5	(Particle size multiplier for PM)
	0.15	(Particle size multiplier for PM2.5)
$a =$	0.9	for PM10
	0.9	for PM2.5
$b =$	0.45	for PM10
	0.45	for PM2.5

^d Control efficiency from watering unpaved roads twice per day, from Table XI-D, Mitigation Measure Examples, Fugitive Dust from Unpaved Roads, http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html

^e Controlled emission factor [lb/mi] = Uncontrolled emission factor [lb/mi] x (1 - Control efficiency [%] / 100)

Table 57
Fugitive Dust Emission Factors
Soil Dropping During Excavation

Emission Factor [lb/cu. yd] = $0.0011 \times (\text{mean wind speed [mi/hr]} / 5)^{1.3} / (\text{moisture [\%]} / 2)^{1.4} \times (\text{number drops per ton}) \times (\text{density [ton/cu. yd]})$
 Reference: AP-42, Equation (1), Section 13.2.4, November 2006

Parameter	Value	Basis
Mean Wind Speed	12	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G, default
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil
Number Drops	4	Assumption
Soil Density	1.215	Table 2.46, Handbook of Solid Waste Management

PM10 Emission Factor (Uncontrolled) 9.94E-04 lb/cu. yd

Reduction from Watering Twice/Day^b 0%

Controlled PM10 Emission Factor 9.94E-04 lb/cu. yd

Controlled PM2.5 Emission Factor^a 2.07E-04 lb/cu. yd

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per cubic yard] x Volume soil handled [cubic yards per day]

Table 57
Fugitive Dust Emission Factors
Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
 Reference: SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-E

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Pct. time wind > 12 mph	100	Worst-case assumption

PM10 Emission Factor (Uncontrolled) 44.0 lb/day-acre
 Reduction from Watering Twice/Day 50%
 Controlled PM10 Emission Factor 22.0 lb/day-acre
 Controlled PM2.5 Emission Factor^a 4.6 lb/day-acre

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per acre-day] x Storage pile surface area [acres]

Table 57
Fugitive Dust Emission Factors
Bulldozing, Scraping and Grading

Emission Factor [lb/hr] = $0.75 \times (\text{silt content [\%]}^{1.5} / (\text{moisture})^{1.4}$
 Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil

PM10 Emission Factor (Uncontrolled) 0.348 lb/hr
 Reduction from Watering Twice/Day 0%
 Controlled PM10 Emission Factor 0.348 lb/hr
 Controlled PM2.5 Emission Factor^a 0.072 lb/hr

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing, scraping or grading time [hours/day]

SOIL IMPORT OPTION 2 WITHOUT PROJECT COMMITMENT J

AIR QUALITY CALCULATIONS

Construction Emissions

The following emissions were calculated for construction activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:
 - a. Daily emissions were calculated for each construction phase for each Proposed Project Component.

These calculations are in Table 7 through Table 50.

Total daily emissions, including both on-site and off-site sources, are summarized by construction phase in Table 1.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

PM10 and PM2.5 emission factors for earth moving and soil handling were calculated from AP-42 sections and from the SCAQMD CEQA Handbook.

These emission factors are in Table 57.
 - b. The construction phases for each Proposed Project component that could overlap were identified, and daily emissions from overlapping phases were added together. The highest emissions that could occur on a single day during construction of each Proposed Project component were then identified. These emissions are summarized in Table 2.
 - c. Since construction of all of the Proposed Project components could occur at the same time, the maximum daily emissions during construction of the components were added together to estimate peak daily construction emissions. However, since substation site demolition and water line relocation activities would be completed prior to the start of any other construction, they were not included in the peak daily emissions calculation. The peak daily construction emissions are in Table 2.
2. Maximum daily on-site emissions during construction of each Proposed Project component for use in a Localized Significance Threshold (LST) analysis using the look-up table in Appendix C to the SCAQMD's Localized Significance Methodology. The following steps were used to calculate these emissions and to conduct the LST analysis.
 - a. Daily on-site emissions were calculated for each construction phase for each Proposed Project Component. On-site emissions for substation construction were defined as emissions that would occur on the substation site. On-site emissions for 500 kV transmission line and 115 kV subtransmission line construction were defined as emissions that would occur at a single 500 kV lattice tower or a 115 kV pole

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location.

These calculations are in Table 9 through Table 50.

On-site daily emissions by construction phase are summarized in Table 3.

The same emission factors used to calculate total daily emission were used to calculate on-site daily emissions.

- b. Since multiple construction phases could occur at the same time at the substation site, daily on-site emissions from overlapping phases were added together to identify maximum on-site daily emissions during substation construction. Maximum daily on-site emissions during telecommunications construction were added to the maximum daily emissions during substation construction, since telecommunications construction will occur at the substation site. Maximum daily on-site emissions Table 4.
- c. Since only one construction phase could occur at a 500 kV transmission line tower location or 115 kV subtransmission line pole location, emissions from overlapping phases were not added together to calculate maximum daily on-site emissions. Maximum daily on-site emissions during 500 kV transmission line and 115 kV subtransmission line construction are in Table 4.
- d. Distances to the closest receptors were determined for the LST analysis. For the substation site, the distance to the closest commercial receptor was used for analyses for CO and NO₂, since the air quality thresholds are for short-term averaging periods. The distance to the closest residential receptor was used for the PM₁₀ and PM_{2.5} analyses, since the air quality thresholds are for 24-hour averaging periods, and an individual would probably not be located at a commercial location for 24 hours.
The closest receptor to a 500 kV transmission tower location is a residence.
A distance of 25 meters was assumed for the receptor distance for the analysis for 115 kV subtransmission line construction.
- e. The look-up table values for the Lake Elsinore source/receptor area were used for the LST analyses.
- f. The maximum construction area in the look-up tables of 5 acres was used for the LST analysis for the substation site, and the minimum area of 1 acre was used for the 500 kV transmission line tower and 115 kV subtransmission line pole analyses.
- g. The maximum allowable daily on-site emissions for the analyses for the substation and 500 kV transmission line towers were calculated using linear interpolation with receptor distance of the emissions in the look-up tables to calculate allowable emissions for the actual receptor distances. Interpolation was not used for the LST analyses for the 115 kV subtransmission line analyses, since the receptor distance was assumed to be 25 meters. The LST analyses are in Table 5.

3. Total greenhouse gas (GHG) emissions during construction. The following steps were used to calculate these emissions:

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- a. Total GHG emissions were calculated for each construction phase for Each Proposed Project Component. These calculations are in Table 9 through Table 50. Total GHG emissions, including both on-site and off-site sources, are summarized by construction phase in Table 6.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

- b. Total GHG emissions during each construction phase were added together to calculate total GHG emissions during construction. These emissions are summarized in Table 6.

Operational Emissions

The following emissions were calculated for operational activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:

- a. Daily emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

- b. It was conservatively assumed that the transmission line inspections would both occur on the same day as a visit to the substation site, and daily emissions from these three activities were added together to peak daily operational emissions. These emissions are in Table 52.

2. Annual greenhouse gas (GHG) emissions during operation. The following steps were used to calculate these emissions:

- a. Annual emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

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The exhaust emission factors are in Table 53 through Table 55.

- b. Annual emissions from leakage of sulfur hexafluoride (SF6) from gas-insulated switch gear (GIS) were calculated by multiplying the total amount of SF6 in new GIS by the estimated annual leakage rate. The annual SF6 leakage rate was then multiplied by the SF6 global warming potential to calculate annual CO2-equivalent emissions from SF6 leakage. These calculations are in Table 52.
- c. Annual GHG emissions from the operational activities and from SF6 leakage were added together to calculate Annual operational GHG emissions. These emissions are summarized in Table 52.

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	3.42	23.90	30.16	0.12	25.15	3.40
Substation Site Water Line Relocation	0.65	6.60	2.80	0.01	39.81	4.08
Substation Construction						
Survey	0.11	0.86	0.07	0.00	12.58	1.25
Grading	6.44	42.22	49.09	0.20	178.99	22.28
Fencing	0.42	4.32	1.30	0.01	35.20	3.52
Civil	2.90	31.01	20.07	0.10	49.97	5.53
Control Building	0.17	1.32	0.20	0.00	32.50	3.24
Electrical	1.26	12.43	6.41	0.03	38.15	4.00
Wiring	0.28	2.25	0.63	0.01	25.18	2.52
Transformers	0.66	6.27	2.25	0.01	46.81	4.74
Maintenance Crew Equipment Check	0.12	0.94	0.19	0.00	34.00	3.40
Testing	0.11	0.87	0.07	0.00	18.77	1.87
Asphalting	2.41	11.86	12.23	0.05	51.66	5.51
Landscaping	1.72	11.07	15.40	0.07	43.25	4.68
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	20.45	2.04
Marshalling Yard	0.63	4.65	2.81	0.02	31.55	3.22
Roads and Landing Work	2.37	19.00	10.34	0.05	54.71	6.83
Install Helicopter Platforms	0.16	1.23	0.10	0.00	0.32	0.02
Tower Removal	1.02	6.57	4.56	0.02	105.34	10.67
Foundation Removal	0.61	6.89	2.73	0.01	49.41	5.03
Tower Foundations Installation	2.01	15.93	6.66	0.06	107.57	10.97
Install Micropile Foundations	0.16	1.23	0.10	0.00	0.32	0.02
Tower Steel Haul	0.31	3.62	0.90	0.01	55.51	5.57
Tower Steel Assembly	0.98	8.03	3.96	0.02	33.29	3.44
Tower Erection	1.46	8.84	6.22	0.03	83.50	8.52
Tower Erection (Helicopter) Ground Support	0.82	6.98	2.35	0.02	94.04	9.44
Tower Helicopter Operations	46.71	56.80	577.42	32.18	12.02	12.02
Wire Stringing	20.27	61.08	38.52	1.51	383.75	39.37
Restoration	1.08	8.31	4.75	0.03	47.70	5.20
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard	0.36	3.35	1.16	0.01	23.35	2.36
Roads and Landing Work	1.79	14.07	8.05	0.04	6.40	1.31
Guard Structure Installation	1.61	10.08	7.33	0.05	0.69	0.27
Remove Existing Wood H-Frames and Poles	1.07	7.58	4.97	0.02	0.60	0.20
Remove Existing Tubular Steel/Light Weight Steel Poles	0.98	5.99	4.23	0.02	0.69	0.18
Install Tubular Steel Pole Foundations	1.41	11.32	5.50	0.05	2.83	0.44
Steel Pole Haul	0.70	3.43	3.10	0.02	0.41	0.12
Steel Pole Assembly	0.98	5.99	4.23	0.02	0.69	0.18
Steel Pole Erection	0.98	5.99	4.23	0.02	0.69	0.18
Wire Stringing	5.07	29.37	24.43	0.15	2.08	0.80
Vault Installation	2.63	17.58	10.62	0.07	2.43	0.60
Duct Bank Installation	1.39	13.75	6.11	0.04	2.84	0.59
Install Underground Cable	3.51	19.09	13.63	0.09	1.50	0.50
Guard Structure Removal	1.50	9.66	7.71	0.04	0.69	0.29
Restoration	1.22	9.85	5.55	0.03	7.12	0.88
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation	0.27	2.81	1.45	0.01	0.30	0.07
Control Building	0.54	3.56	3.15	0.02	0.23	0.09
Overhead Communications Installation	0.60	3.97	3.18	0.02	0.33	0.10
Substation Telecommunications Equipment Installation	0.08	0.62	0.05	0.00	0.16	0.01
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	35.67	3.60
Additional Substation Construction						

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	1.16	12.41	6.30	0.03	11.38	1.32
Electrical	1.41	13.32	7.68	0.03	0.84	0.31
Wiring	0.44	3.97	1.56	0.01	0.59	0.09
Testing	0.11	0.83	0.07	0.00	0.22	0.02
Civil - Demo	0.58	5.75	3.19	0.02	11.35	1.22

Table 2
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Construction						
Survey	0.11	0.86	0.07	0.00	12.58	1.25
Grading	6.44	42.22	49.09	0.20	178.99	22.28
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	5.43	40.28	23.30	0.12	282.27	28.80
Civil	2.90	31.01	20.07	0.10	49.97	5.53
Landscaping	1.72	11.07	15.40	0.07	43.25	4.68
Maximum	6.44	42.22	49.09	0.20	282.27	28.80
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	20.45	2.04
Marshalling Yard, Road and Landing Work, Install Helicopter Platforms	3.15	24.89	13.25	0.07	86.59	10.07
Marshalling Yard, Tower Removal, Tower Foundations Installation, Install Micropile Foundations, Tower Steel Haul, Tower Steel Assembly, Tower Erection, Tower Erection (Helicopter) Ground Support, Tower Helicopter Operations	54.09	112.65	604.98	32.37	523.14	63.88
Marshalling Yard, Foundation Removal	1.24	11.55	5.54	0.03	80.96	8.26
Marshalling Yard, Wire Stringing	20.89	65.73	41.33	1.52	415.30	42.59
Restoration	1.08	8.31	4.75	0.03	47.70	5.20
Maximum	54.09	112.65	604.98	32.37	523.14	63.88
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard, Roads and Landing Work, Guard Structure Installation, Remove Existing Wood H-Frames and Poles, Remove Existing Tubular Steel/Light Weight Steel Poles, Install Tubular Steel Pole Foundations, Steel Pole Haul, Steel Pole Assembly, Steel Pole Erection, Wire Stringing, Guard Structure Removal, Vault Installation, Duct Bank Installation, Install Underground Cable	23.99	157.27	105.30	0.64	45.89	8.02
Restoration	1.22	9.85	5.55	0.03	7.12	0.88
Maximum	23.99	157.27	105.30	0.64	45.89	8.02
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation, Control Building, Overhead Communications Installation, Substation Telecommunications Equipment Installation	1.49	10.96	7.83	0.05	1.02	0.28
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	35.67	3.60
Maximum	1.49	10.96	7.83	0.05	35.67	3.60
Additional Substation Construction						
Civil, Electrical, Wiring, Testing, Civil - Demo	3.68	36.28	18.80	0.09	24.38	2.95
Maximum	3.68	36.28	18.80	0.09	24.38	2.95
PEAK DAILY^b	89.69	359.37	786.00	33.35	911.34	107.25

^a The construction phases within a group could all occur at the same time.

^b Peak daily emissions are the sum of the maximum daily emissions during construction of the substation, the 500 kV transmission lines, the 115 kV subtransmission lines, the telecommunications facilities, and additional substation construction.

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	21.85	2.51
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	39.43	4.05
Substation Construction						
Survey	0.00	0.03	0.00	0.00	12.37	1.24
Grading	3.72	26.92	20.27	0.07	174.50	21.13
Fencing	0.16	2.27	1.13	0.00	34.66	3.48
Civil	1.69	23.53	10.30	0.04	48.67	5.11
Control Building	0.01	0.09	0.09	0.00	32.18	3.22
Electrical	0.87	9.35	6.16	0.02	37.35	3.94
Wiring	0.08	0.61	0.49	0.00	24.75	2.49
Transformers	0.40	4.21	2.08	0.01	46.27	4.70
Maintenance Crew Equipment Check	0.02	0.12	0.12	0.00	33.79	3.38
Testing	0.01	0.05	0.00	0.00	18.55	1.86
Asphalting	1.52	6.44	4.79	0.01	50.12	5.19
Landscaping	0.30	2.81	1.80	0.00	40.86	4.12
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	31.20	3.18
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	23.13	2.35
Roads and Landing Work	1.60	12.73	7.50	0.04	6.06	1.27
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	2.34	0.37
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	1.09	0.43
Duct Bank Installation	0.71	8.86	3.54	0.02	1.53	0.43
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	6.64	0.83
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	35.45	3.58
Additional Substation Construction						

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	10.89	1.20
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	10.92	1.15

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	21.85	2.51
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	39.43	4.05
Substation and Telecommunications Construction						
Survey	0.00	0.03	0.00	0.00	12.37	1.24
Grading	3.72	26.92	20.27	0.07	174.50	21.13
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	3.05	23.14	14.86	0.04	277.65	28.26
Civil	1.69	23.53	10.30	0.04	48.67	5.11
Landscaping	0.30	2.81	1.80	0.00	40.86	4.12
Maximum Substation Construction	3.72	26.92	20.27	0.07	277.65	28.26
Maxim Substation plus Telecommunications	4.55	33.66	24.65	0.09	313.11	31.84
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	31.20	3.18
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
Maximum	5.93	32.28	29.00	0.15	31.20	3.18
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	23.13	2.35
Roads and Landing Work	1.60	12.73	7.50	0.04	6.06	1.27
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	2.34	0.37
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	1.09	0.43
Duct Bank Installation	0.71	8.86	3.54	0.02	1.53	0.43
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	6.64	0.83
Maximum	4.34	23.98	22.32	0.13	23.13	2.35
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	35.45	3.58
Maximum	0.83	6.74	4.38	0.02	35.45	3.58
Additional Substation Construction						

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	10.89	1.20
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	10.92	1.15
Maximum	1.15	11.27	7.51	0.02	10.92	1.20

^a The construction phases within a group could all occur at the same time at the same location.

The following 115 kV Subtransmission Line construction activity emissions were divided by the following number of locations:

- Roads and Landing Work: 6 structure pads per day
- Guard Structure Installation: 4 structures per day
- Remove Existing H-Frames and Poles: 15 poles per day
- Remove Existing Tubular Steel/Light Weight Steel Poles: 2 poles per day
- Steel Pole Assembly: 2 poles per day
- Steel Pole Erection: 2 poles per day
- Guard Structure Removal: 6 structures per day
- Restoration: 6 structure pads per day

Table 5
Construction Emissions
Localized Significance Threshold Analysis

Pollutant	Maximum Daily Onsite Emissions	Receptor Distance (m)	Allowable Emissions Interpolation ^a				Interpolated Emissions (lb/day) ^b	Allowable Exceeded?
			Distance 1 (m)	Emissions 1 (lb/day)	Distance 2 (m)	Emissions 2 (lb/day)		
Demolition^{c,d}								
CO	13	270	200	7,535	500	25,792	11,795	No
NOx	8	270	200	672	500	1,072	765	No
PM10	22	420	200	96	500	207	177	No
PM2.5	3	420	200	31	500	105	85	No
Water Line Relocation^{c,e}								
CO	5	270	200	4,850	500	21,040	8,628	No
NOx	3	270	200	460	500	896	562	No
PM10	39	420	200	67	500	178	148	No
PM2.5	4	420	200	20	500	86	68	No
Substation and Telecommunications Construction^c								
CO	34	270	200	7,535	500	25,792	11,795	No
NOx	25	270	200	672	500	1,072	765	No
PM10	313	420	200	96	500	207	177	Yes
PM2.5	32	420	200	31	500	105	85	No
500 kV Transmission Line Construction^f								
CO	32	93	50	974	100	1,918	1,786	No
NOx	29	93	50	203	100	292	280	No
PM10	31	93	50	12	100	30	27	Yes
PM2.5	3	93	50	4	100	8	7	No
115 kV Subtransmission Line Construction^g								
CO	24	25	25	661	25	661	661	No
NOx	22	25	25	162	25	162	162	No
PM10	23	25	25	13	25	13	13	Yes
PM2.5	2	25	25	3	25	3	3	No

^a Allowable emissions are from Appendix C to Final Localized Significance Methodology, SCAQMD, revised July 2008, downloaded from <http://www.aqmd.gov/ceqa/handbook/LST/LST.html>

^b Interpolated emissions = Emissions 1 + (Receptor distance - Distance 1) x (Emissions 2 - Emissions 1) / (Distance 2 - Distance 1)

^c CO and NOx receptor distances are closest commercial receptor; PM10 and PM2.5 are closest residential receptor. Allowable emissions are for a 5 acre site.

^d Allowable emissions are for a 5 acre site.

^e Allowable emissions are for a 1 acre site.

^f Closest receptor to a transmission tower base is a residence at approximately 93 meters. Allowable emissions are for a 1 acre site.

^g Allowable emissions for CO, NOx and PM2.5 are for a 1-acre site to represent construction at a pole location.

Maximum PM10 emissions occur at the marshalling yard, so allowable emissions are for a 5-acre site

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO ₂ e (MT)
Substation Site Demolition	283.31
Substation Site Water Line Relocation	11.84
Substation Construction	
Survey	1.89
Grading	561.85
Fencing	7.31
Civil	375.00
Control Building	4.02
Electrical	346.90
Wiring	71.94
Transformers	57.20
Maintenance Crew Equipment Check	8.83
Testing	25.71
Asphalting	66.81
Landscaping	144.94
500 kV Transmission Line Construction	
Survey	0.52
Marshalling Yard	87.79
Roads and Landing Work	53.15
Install Helicopter Platforms	32.89
Tower Removal	4.03
Foundation Removal	1.46
Tower Foundations Installation	63.63
Install Micropile Foundations	122.15
Tower Steel Haul	3.76
Tower Steel Assembly	38.82
Tower Erection	32.96
Tower Erection (Helicopter) Ground Support	6.40
Tower Helicopter Operations	1,626.43
Wire Stringing	18.53
Restoration	4.27
115 kV Subtransmission Line Construction	
Survey	2.54
Marshalling Yard	145.31
Roads and Landing Work	128.76
Guard Structure Installation	52.96
Remove Existing Wood H-Frames and Poles	24.84
Remove Existing Tubular Steel/Light Weight Steel Poles	4.98
Install Tubular Steel Pole Foundations	159.88
Steel Pole Haul	95.64
Steel Pole Assembly	254.01
Steel Pole Erection	254.01
Wire Stringing	541.72
Vault Installation	15.31
Duct Bank Installation	17.61
Install Underground Cable	94.21
Guard Structure Removal	29.04
Restoration	22.66
Telecommunications Construction	
Tower Foundation	3.69

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO₂e (MT)
Tower Construction	29.76
Dish Installation	2.99
Control Building	21.81
Overhead Communications Installation	28.92
Substation Telecommunications Equipment Installation	0.91
Santiago Peak Communication Site	18.85
Additional Substation Construction	
Civil	11.89
Electrical	24.70
Wiring	12.80
Testing	2.43
Civil - Demo	6.67
Total	6,073.23

**Table 7
Substation Site Demolition Emissions**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.39	12.69	7.61	0.02	0.39	0.36	47.9
Onsite Motor Vehicle Exhaust	0.01	0.04	0.09	0.00	0.00	0.00	1.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	21.45	2.14	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.39	12.73	7.70	0.02	21.85	2.51	48.9
Offsite Motor Vehicle Exhaust	2.03	11.17	22.45	0.10	1.19	0.89	234.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	2.11	0.00	
Offsite Total	2.03	11.17	22.45	0.10	3.30	0.89	234.4
Total	3.42	23.90	30.16	0.12	25.15	3.40	283.3

Construction Equipment Summary

Equipment	Horsepower	Number	Days Used	Hours Used/Day
Track Loader	148	2	50	8
Bobcat	75	1	50	4

Construction Equipment Exhaust Emission Factors

Equipment	Horsepower	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Track Loader	148	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Track Loader	1.32	11.62	7.11	0.02	0.39	0.35
Bobcat	0.07	1.07	0.50	0.00	0.01	0.01
Total	1.39	12.69	7.61	0.02	0.39	0.36

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Track Loader	44.0	0.0	44.0
Bobcat	3.9	0.0	3.9
Total	47.9	0.0	47.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	1	50	4	10
Offsite				
Dump Truck	40	50	N/A	60
Worker Commute	4	50	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 20,000 CY hauled offsite over 50 days and 10 CY/truck = 20,000 / 50 / 10 = 40

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 7
Substation Site Demolition Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.01	0.04	0.09	0.00	0.00	0.00
Offsite						
Dump Truck	1.92	10.35	22.38	0.10	1.16	0.87
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	2.03	11.17	22.45	0.10	1.19	0.89
Total	2.04	11.21	22.54	0.10	1.19	0.89

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	1.0	0.0	1.0
Onsite Total	1.0	0.0	1.0
Offsite			
Dump Truck	228.3	0.0	228.4
Worker Commute	6.0	0.0	6.1
Offsite Total	234.4	0.0	234.4
Total	235.3	0.0	235.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Onsite Total						21.45	2.14
Offsite							
Dump Truck	40	Paved	60	0.001	0.000	1.92	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						2.11	0.00
Total						23.56	2.14

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion ^d	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 8
Substation Site Water Line Relocation Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	5.08	2.56	0.01	0.10	0.10	7.4
Onsite Motor Vehicle Exhaust	0.01	0.09	0.12	0.00	0.01	0.01	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	39.18	3.92	
Earthwork Fugitive PM	--	--	--	--	0.15	0.03	
Onsite Total	0.47	5.16	2.68	0.01	39.43	4.05	7.6
Offsite Motor Vehicle Exhaust	0.18	1.44	0.12	0.00	0.04	0.03	4.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.18	1.44	0.12	0.00	0.38	0.03	4.2
Total	0.65	6.60	2.80	0.01	39.81	4.08	11.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	20	8
Crane	125	1	20	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.46	5.08	2.56	0.01	0.10	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	3.8	0.0	3.8
Crane	3.6	0.0	3.6
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	20	1	2.5
Stakebed Truck	2	20	2	5
Crew Vehicle	2	20	2	5
Offsite				
Worker Commute	7	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Stakebed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Highest (Most Conservative) EMFAC2007 (version 2.3) or Highest (Most Conservative) EMFAC2007 (version 2.3)

Table 8
Substation Site Water Line Relocation Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.00	0.01	0.02	0.00	0.00	0.00
Stakebed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.12	0.00	0.01	0.01
Offsite						
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.18	1.44	0.12	0.00	0.04	0.03
Total	0.20	1.53	0.24	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.2	0.0	0.2
Offsite			
Worker Commute	4.2	0.0	4.2
Offsite Total	4.2	0.0	4.2
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Stakebed Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Crew Vehicle	2	Unpaved	5	1.237	0.124	12.37	1.24
Onsite Total						39.18	3.92
Offsite							
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						39.51	3.92

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	147	9.94E-04	2.07E-04	0.15	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.15	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Based on trench 4 ft. wide x 6 ft. deep x 1,700 ft. long over 20 days x 2 = 4 ft. x 6 ft. x 1,770 ft. / 27 cu. ft. per CY / 20 days = 151 CY/day 7

**Table 9
Substation Construction Emissions
Survey**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.03	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	12.37	1.24	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.03	0.00	0.00	12.37	1.24	0.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	1.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	1.8
Total	0.11	0.86	0.07	0.00	12.58	1.25	1.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Vehicle	2	15	2	5
Offsite				
Worker Commute	4	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 9
Substation Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.03	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.86	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	1.8	0.0	1.8
Offsite Total	1.8	0.0	1.8
Total	1.9	0.0	1.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Vehicle	2	Unpaved	5	1.237	0.124	12.37	1.24
Onsite Total						12.37	1.24
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						12.56	1.24

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 10
Substation Construction Emissions
Grading

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	3.67	26.54	20.08	0.07	0.79	0.73	188.2
Onsite Motor Vehicle Exhaust	0.05	0.38	0.19	0.00	0.02	0.01	4.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	145.73	14.57	
Earthwork Fugitive PM	--	--	--	--	27.96	5.82	
Onsite Total	3.72	26.92	20.27	0.07	174.50	21.13	192.9
Offsite Motor Vehicle Exhaust	2.73	15.30	28.82	0.13	1.55	1.15	369.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	2.94	0.00	
Offsite Total	2.73	15.30	28.82	0.13	4.49	1.15	369.0
Total	6.44	42.22	49.09	0.20	178.99	22.28	561.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Dozer	305	1	60	7
Loader	147	2	60	4
Scraper	267	1	60	7
Grader	110	1	60	7
4x4 Backhoe	79	2	60	7
4x4 Tamper	174	1	60	7

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Dozer	305	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Loader	147	0.055	0.620	0.259	0.001	0.013	0.012	106.315	0.005	Rubber Tired Loaders
Scraper	267	0.176	0.733	0.973	0.003	0.036	0.034	321.428	0.016	Scrapers
Grader	110	0.052	0.501	0.322	0.001	0.015	0.014	74.965	0.005	Graders
4x4 Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
4x4 Tamper	174	0.038	0.586	0.173	0.001	0.007	0.007	106.516	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Dozer	0.97	4.11	5.27	0.02	0.20	0.18
Loader	0.44	4.96	2.07	0.01	0.10	0.10
Scraper	1.23	5.13	6.81	0.02	0.26	0.23
Grader	0.36	3.51	2.25	0.01	0.11	0.10
4x4 Backhoe	0.39	4.73	2.47	0.01	0.08	0.07
4x4 Tamper	0.27	4.10	1.21	0.01	0.05	0.05
Total	3.67	26.54	20.08	0.07	0.79	0.73

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Dozer	49.4	0.0	49.4
Loader	23.1	0.0	23.2
Scraper	61.2	0.0	61.3
Grader	14.3	0.0	14.3
4x4 Backhoe	19.7	0.0	19.7
4x4 Tamper	20.3	0.0	20.3
Total	188.1	0.0	188.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 10
Substation Construction Emissions
Grading

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	1	60	7	17.5
Crew Vehicle	5	60	7	17.5
Offsite				
Dump Truck	96	60	N/A	32
Worker Commute	10	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.01	0.08	0.16	0.00	0.01	0.01
Crew Vehicle	0.04	0.30	0.03	0.00	0.01	0.01
Onsite Total	0.05	0.38	0.19	0.00	0.02	0.01
Offsite						
Dump Truck	2.46	13.24	28.65	0.12	1.49	1.12
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	2.73	15.30	28.82	0.13	1.55	1.15
Total	2.78	15.67	29.01	0.13	1.57	1.17

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	2.0	0.0	2.0
Crew Vehicle	2.6	0.0	2.6
Onsite Total	4.6	0.0	4.6
Offsite			
Dump Truck	350.7	0.0	350.8
Worker Commute	18.1	0.0	18.2
Offsite Total	368.9	0.0	369.0
Total	373.5	0.0	373.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	17.5	2.145	0.214	37.53	3.75
Crew Vehicle	5	Unpaved	17.5	1.237	0.124	108.20	10.82
Onsite Total						145.73	14.57
Offsite							
Dump Truck	96	Paved	32	0.001	0.000	2.46	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						2.94	0.00
Total						148.67	14.57

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 10
Substation Construction Emissions
Grading

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	3,078	9.94E-04	2.07E-04	3.06	0.64
Bulldozing, Scraping and Grading	hr/day	21	0.348	0.072	7.30	1.52
Storage Pile Wind Erosion ^d	acres	0.4	44.0	9.15	17.60	3.66
Total					27.96	5.82

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 184,700 CY over 60 days

^d Based on 1,000 CY in each of two cones 9 ft. tall x 100 ft. diameter

Table 11
Substation Construction Emissions
Fencing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	2.13	0.99	0.00	0.02	0.02	2.3
Onsite Motor Vehicle Exhaust	0.02	0.13	0.14	0.00	0.01	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	34.63	3.46	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.16	2.27	1.13	0.00	34.66	3.48	2.8
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	4.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	4.5
Total	0.42	4.32	1.30	0.01	35.20	3.52	7.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bobcat	75	1	15	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bobcat	0.14	2.13	0.99	0.00	0.02	0.02
Total	0.14	2.13	0.99	0.00	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bobcat	2.3	0.0	2.3
Total	2.3	0.0	2.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	15	3	7.5
Crewcab Truck	3	15	2	5
Offsite				
Worker Commute	10	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Crewcab Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 11
Substation Construction Emissions
Fencing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.01	0.04	0.05	0.00	0.00	0.00
Crewcab Truck	0.01	0.09	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.13	0.14	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.19	0.31	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crewcab Truck	0.3	0.0	0.3
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	4.5	0.0	4.5
Offsite Total	4.5	0.0	4.5
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	7.5	2.145	0.214	16.09	1.61
Crewcab Truck	3	Unpaved	5	1.237	0.124	18.55	1.85
Onsite Total						34.63	3.46
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						35.11	3.46

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 12
Substation Construction Emissions
Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.68	23.43	10.09	0.04	0.26	0.24	155.6
Onsite Motor Vehicle Exhaust	0.02	0.10	0.21	0.00	0.01	0.01	3.9
Onsite Motor Vehicle Fugitive PM	--	--	--	--	48.26	4.83	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	1.69	23.53	10.30	0.04	48.67	5.11	159.4
Offsite Motor Vehicle Exhaust	1.21	7.48	9.77	0.05	0.58	0.43	215.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	1.21	7.48	9.77	0.05	1.30	0.43	215.6
Total	2.90	31.01	20.07	0.10	49.97	5.53	375.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	152	2	90	4
Foundation Auger	79	2	90	7
Backhoe	79	3	90	6
Skip Loader	75	2	90	3
Bobcat Skid Steer	75	2	90	4
Forklift	83	1	90	4
17-Ton Crane	125	1	90	2

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Foundation Auger	79	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Skip Loader	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts
17-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.41	5.31	1.59	0.01	0.07	0.07
Foundation Auger	0.35	6.52	2.74	0.01	0.03	0.03
Backhoe	0.51	6.08	3.17	0.01	0.10	0.09
Skip Loader	0.10	1.60	0.74	0.00	0.01	0.01
Bobcat Skid Steer	0.14	2.13	0.99	0.00	0.02	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
17-Ton Crane	0.09	0.95	0.46	0.00	0.02	0.02
Total	1.68	23.43	10.09	0.04	0.26	0.24

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	36.7	0.0	36.7
Foundation Auger	44.1	0.0	44.1
Backhoe	38.0	0.0	38.1
Skip Loader	10.5	0.0	10.5
Bobcat Skid Steer	26.2	0.0	26.3
Forklift	0.0	0.0	0.0
17-Ton Crane	0.0	0.0	0.0
Total	155.5	0.0	155.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 12
Substation Construction Emissions
Civil

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	90	2	5
Water Truck	1	90	5	12.5
Offsite				
Concrete Truck	17	90	N/A	60
Worker Commute	15	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Water Truck	0.01	0.05	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.10	0.21	0.00	0.01	0.01
Offsite						
Concrete Truck	0.82	4.40	9.51	0.04	0.50	0.37
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	1.21	7.48	9.77	0.05	0.58	0.43
Total	1.23	7.58	9.98	0.05	0.59	0.44

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	1.7	0.0	1.7
Water Truck	2.1	0.0	2.1
Onsite Total	3.9	0.0	3.9
Offsite			
Concrete Truck	174.7	0.0	174.7
Worker Commute	40.8	0.0	40.8
Offsite Total	215.5	0.0	215.6
Total	219.4	0.0	219.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Water Truck	1	Unpaved	12.5	2.145	0.214	26.81	2.68
Onsite Total						48.26	4.83
Offsite							
Concrete Truck	17	Paved	60	0.001	0.000	0.82	0.00
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						48.98	4.83

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 12
Substation Construction Emissions
Civil

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

**Table 13
Substation Construction Emissions
Control Building**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.09	0.09	0.00	0.00	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	32.17	3.22	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.09	0.09	0.00	32.18	3.22	0.4
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	3.6
Total	0.17	1.32	0.20	0.00	32.50	3.24	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Carry-all Truck	2	20	2	5
Stake Truck	1	20	2	5
Offsite				
Worker Commute	6	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Carry-all Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 13
Substation Construction Emissions
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Carry-all Truck	0.01	0.06	0.06	0.00	0.00	0.00
Stake Truck	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.09	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.17	1.32	0.20	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Carry-all Truck	0.3	0.0	0.3
Stake Truck	0.1	0.0	0.1
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	4.0	0.0	4.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Carry-all Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Stake Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Onsite Total						32.17	3.22
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						32.46	3.22

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 14
Substation Construction Emissions
Electrical

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.85	9.25	6.15	0.02	0.25	0.23	206.2
Onsite Motor Vehicle Exhaust	0.01	0.10	0.01	0.00	0.00	0.00	4.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	37.10	3.71	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.87	9.35	6.16	0.02	37.35	3.94	210.8
Offsite Motor Vehicle Exhaust	0.39	3.08	0.26	0.01	0.09	0.06	136.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	0.39	3.08	0.26	0.01	0.81	0.06	136.1
Total	1.26	12.43	6.41	0.03	38.15	4.00	346.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Scissor Lift	87	2	300	5
Manlift	43	2	300	7
Reach Manlift	87	2	300	6
15-Ton Crane	125	1	300	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Scissor Lift	0.18	2.26	1.50	0.00	0.06	0.06
Manlift	0.23	1.89	1.71	0.00	0.05	0.04
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.85	9.25	6.15	0.02	0.25	0.23

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Scissor Lift	51.8	0.0	51.9
Manlift	37.4	0.0	37.4
Reach Manlift	62.2	0.0	62.2
15-Ton Crane	54.7	0.0	54.7
Total	206.0	0.0	206.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	6	300	2	5
Offsite				
Worker Commute	15	300	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 14
Substation Construction Emissions
Electrical

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.10	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	0.39	3.08	0.26	0.01	0.09	0.06
Total	0.40	3.19	0.27	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	4.5	0.0	4.5
Onsite Total	4.5	0.0	4.5
Offsite			
Worker Commute	136.0	0.0	136.1
Offsite Total	136.0	0.0	136.1
Total	140.6	0.0	140.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	6	Unpaved	5	1.237	0.124	37.10	3.71
Onsite Total						37.10	3.71
Offsite							
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						37.82	3.71

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 15
Substation Construction Emissions
Wiring

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.07	0.54	0.49	0.00	0.01	0.01	8.9
Onsite Motor Vehicle Exhaust	0.01	0.07	0.01	0.00	0.00	0.00	2.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	24.73	2.47	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.08	0.61	0.49	0.00	24.75	2.49	11.4
Offsite Motor Vehicle Exhaust	0.21	1.65	0.14	0.01	0.05	0.03	60.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.21	1.65	0.14	0.01	0.43	0.03	60.5
Total	0.28	2.25	0.63	0.01	25.18	2.52	71.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	1	250	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.07	0.54	0.49	0.00	0.01	0.01

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	8.9	0.0	8.9
Total	8.9	0.0	8.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	250	2	5
Offsite				
Worker Commute	8	250	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 15
Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.07	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.21	1.65	0.14	0.01	0.05	0.03
Total	0.22	1.71	0.14	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	2.5	0.0	2.5
Onsite Total	2.5	0.0	2.5
Offsite			
Worker Commute	60.5	0.0	60.5
Offsite Total	60.5	0.0	60.5
Total	63.0	0.0	63.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	1.237	0.124	24.73	2.47
Onsite Total						24.73	2.47
Offsite							
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.38	0.00
Total						25.12	2.47

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 16
Substation Construction Emissions
Transformers**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.38	4.10	1.98	0.01	0.09	0.08	27.4
Onsite Motor Vehicle Exhaust	0.02	0.11	0.10	0.00	0.01	0.00	2.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	46.18	4.62	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.40	4.21	2.08	0.01	46.27	4.70	30.0
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	27.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	27.2
Total	0.66	6.27	2.25	0.01	46.81	4.74	57.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Crane	125	1	90	6
Forklift	83	1	90	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Crane	0.28	2.85	1.38	0.01	0.07	0.07
Forklift	0.10	1.25	0.60	0.00	0.01	0.01
Total	0.38	4.10	1.98	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Crane	19.7	0.0	19.7
Forklift	7.6	0.0	7.7
Total	27.3	0.0	27.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	90	2	5
Low Bed Truck	1	90	4	10
Offsite				
Worker Commute	10	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Low Bed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 16
Substation Construction Emissions
Transformers

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Low Bed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.10	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.17	0.27	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.9	0.0	0.9
Low Bed Truck	1.7	0.0	1.7
Onsite Total	2.6	0.0	2.6
Offsite			
Worker Commute	27.2	0.0	27.2
Offsite Total	27.2	0.0	27.2
Total	29.8	0.0	29.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	1.237	0.124	24.73	2.47
Low Bed Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Onsite Total						46.18	4.62
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						46.66	4.62

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.02	0.12	0.12	0.00	0.01	0.00	1.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	33.78	3.38	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.02	0.12	0.12	0.00	33.79	3.38	1.6
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	7.3
Total	0.12	0.94	0.19	0.00	34.00	3.40	8.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Maintenance Truck	2	60	4	10
Offsite				
Worker Commute	4	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Maintenance Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Maintenance Truck	0.02	0.12	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.12	0.12	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.94	0.19	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Maintenance Truck	1.6	0.0	1.6
Onsite Total	1.6	0.0	1.6
Offsite			
Worker Commute	7.3	0.0	7.3
Offsite Total	7.3	0.0	7.3
Total	8.8	0.0	8.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Maintenance Truck	2	Unpaved	10	1.689	0.169	33.78	3.38
Onsite Total						33.78	3.38
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						33.98	3.38

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 18
Substation Construction Emissions
Testing**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.05	0.00	0.00	0.00	0.00	1.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	18.55	1.85	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.05	0.00	0.00	18.55	1.86	1.5
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	24.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	24.2
Total	0.11	0.87	0.07	0.00	18.77	1.87	25.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	200	3	7.5
Offsite				
Worker Commute	4	200	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 18
Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.05	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.05	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.87	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	1.5	0.0	1.5
Onsite Total	1.5	0.0	1.5
Offsite			
Worker Commute	24.2	0.0	24.2
Offsite Total	24.2	0.0	24.2
Total	25.7	0.0	25.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Unpaved	7.5	1.237	0.124	18.55	1.85
Onsite Total						18.55	1.85
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						18.74	1.85

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 19
Substation Construction Emissions
Asphalting

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.33	4.62	0.01	0.21	0.19	12.0
Onsite Motor Vehicle Exhaust	0.02	0.11	0.17	0.00	0.01	0.01	1.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	49.90	4.99	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Asphaltic Paving VOC	0.6	--	--	--	--	--	--
Onsite Total	1.52	6.44	4.79	0.01	50.12	5.19	13.2
Offsite Motor Vehicle Exhaust	0.89	5.42	7.45	0.04	0.44	0.32	53.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.11	0.00	
Offsite Total	0.89	5.42	7.45	0.04	1.54	0.32	53.6
Total	2.41	11.86	12.23	0.05	51.66	5.51	66.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Paving Roller	46	2	30	4
Asphalt Paver	152	1	30	4
Tractor	45	1	30	3
Asphalt Curb Machine	35	1	30	3

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Paving Roller	46	0.034	0.226	0.178	0.000	0.007	0.006	25.983	0.003	Rollers
Asphalt Paver	152	0.090	0.754	0.524	0.001	0.029	0.026	128.285	0.008	Pavers
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Asphalt Curb Machine	35	0.047	0.235	0.179	0.000	0.010	0.009	23.927	0.004	Paving Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Paving Roller	0.28	1.81	1.42	0.00	0.05	0.05
Asphalt Paver	0.36	3.02	2.10	0.01	0.11	0.11
Tractor	0.09	0.80	0.57	0.00	0.01	0.01
Asphalt Curb Machine	0.14	0.71	0.54	0.00	0.03	0.03
Total	0.87	6.33	4.62	0.01	0.21	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Paving Roller	2.8	0.0	2.8
Asphalt Paver	7.0	0.0	7.0
Tractor	1.2	0.0	1.2
Asphalt Curb Machine	1.0	0.0	1.0
Total	12.0	0.0	12.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Stake Truck	1	30	4	10
Dump Truck	1	30	3	7.5
Crew Truck	2	30	2	5
Offsite				
Asphalt Delivery Truck	13	30	N/A	60
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Asphalt delivery trucks based on 3,900 CY over 30 days and 10 CY/truck = 3,900 / 30 / 10 = 13

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 19
Substation Construction Emissions
Asphalting

Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Asphalt Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Stake Truck	0.01	0.04	0.09	0.00	0.00	0.00
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.17	0.00	0.01	0.01
Offsite						
Asphalt Delivery Truck	0.63	3.36	7.27	0.03	0.38	0.28
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.89	5.42	7.45	0.04	0.44	0.32
Total	0.91	5.53	7.61	0.04	0.45	0.33

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Stake Truck	0.6	0.0	0.6
Dump Truck	0.4	0.0	0.4
Crew Truck	0.2	0.0	0.2
Onsite Total	1.2	0.0	1.2
Offsite			
Asphalt Delivery Truck	44.5	0.0	44.5
Worker Commute	9.1	0.0	9.1
Offsite Total	53.6	0.0	53.6
Total	54.7	0.0	54.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Stake Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Dump Truck	1	Unpaved	7.5	2.145	0.214	16.09	1.61
Crew Truck	2	Unpaved	5	1.237	0.124	12.37	1.24
Onsite Total						49.90	4.99
Offsite							
Asphalt Delivery Truck	13	Paved	60	0.001	0.000	0.62	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.11	0.00
Total						51.00	4.99

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Asphaltic Paving VOC Emissions

Area Paved (acre/day) ^a	Emission Factor (lb/acre) ^b	VOC (lb/day) ^c
0.24	2.62	0.6

^a Assumed twice daily average for 156,000 ft² total in 30 days:

2 x 156,000 ft² / 30 days / 43,560 ft² per acre = 0.24 acres

^b From URBEMISS 2007 User's Guide, Appendix A,

<http://www.urbemis.com/software/download.html>

^c Emissions [lb/day] = Emission factor [lb/acre] x Area paved [acre/day]

Table 20
Substation Construction Emissions
Landscaping

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	2.71	1.73	0.00	0.03	0.03	6.9
Onsite Motor Vehicle Exhaust	0.01	0.10	0.08	0.00	0.01	0.00	1.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	40.82	4.08	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.30	2.81	1.80	0.00	40.86	4.12	8.0
Offsite Motor Vehicle Exhaust	1.42	8.26	13.60	0.06	0.76	0.56	136.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.63	0.00	
Offsite Total	1.42	8.26	13.60	0.06	2.39	0.56	136.9
Total	1.72	11.07	15.40	0.07	43.25	4.68	144.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Tractor	45	1	45	7
Forklift	83	1	45	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Tractor	0.22	1.87	1.33	0.00	0.03	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.29	2.71	1.73	0.00	0.03	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Tractor	4.3	0.0	4.3
Forklift	2.5	0.0	2.6
Total	6.9	0.0	6.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	1	45	3	7.5
Crew Truck	4	45	2	5
Offsite				
Crushed Rock Delivery Truck	24	45	N/A	60
Worker Commute	10	45	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Crushed rock delivery trucks based on 10,800 CY over 45 days and 10 CY/truck = 10,800 / 45 / 10 = 24

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Crushed Rock Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 20
Substation Construction Emissions
Landscaping

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.08	0.00	0.01	0.00
Offsite						
Crushed Rock Delivery Truck	1.15	6.21	13.43	0.06	0.70	0.52
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	1.42	8.26	13.60	0.06	0.76	0.56
Total	1.43	8.36	13.68	0.06	0.76	0.57

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.6	0.0	0.6
Crew Truck	0.5	0.0	0.5
Onsite Total	1.1	0.0	1.1
Offsite			
Crushed Rock Delivery Truck	123.3	0.0	123.3
Worker Commute	13.6	0.0	13.6
Offsite Total	136.9	0.0	136.9
Total	138.0	0.0	138.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	1	Unpaved	7.5	2.145	0.214	16.09	1.61
Crew Truck	4	Unpaved	5	1.237	0.124	24.73	2.47
Onsite Total						40.82	4.08
Offsite							
Crushed Rock Delivery Truck	24	Paved	60	0.001	0.000	1.15	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.63	0.00
Total						42.45	4.08

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 21
500 kV Transmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.11	0.89	0.08	0.00	0.03	0.02	0.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	20.42	2.02	
Offsite Total	0.11	0.89	0.08	0.00	20.45	2.04	0.5
Total	0.11	0.89	0.08	0.00	20.45	2.04	0.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1/2-Ton Pick-up Truck, 4x4	2	4	N/A	10
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1/2-Ton Pick-up Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 21
500 kV Transmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1/2-Ton Pick-up Truck, 4x4	0.01	0.07	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.11	0.89	0.08	0.00	0.03	0.02
Total	0.11	0.89	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1/2-Ton Pick-up Truck, 4x4	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	0.5	0.0	0.5
Total	0.5	0.0	0.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1/2-Ton Pick-up Truck, 4x4	2	Unpaved	10	1.012	0.101	20.23	2.02
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						20.42	2.02
Total						20.42	2.02

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.41	3.14	1.79	0.01	0.06	0.06	55.8
Onsite Motor Vehicle Exhaust	0.02	0.10	0.14	0.00	0.01	0.01	4.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	31.13	3.11	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.43	3.24	1.93	0.01	31.20	3.18	59.9
Offsite Motor Vehicle Exhaust	0.20	1.41	0.87	0.01	0.06	0.04	27.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.28	0.00	
Offsite Total	0.20	1.41	0.87	0.01	0.35	0.04	27.9
Total	0.63	4.65	2.81	0.02	31.55	3.22	87.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	137	5
Rough Terrain Forklift	125	1	137	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.27	1.16	1.35	0.01	0.05	0.04
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.41	3.14	1.79	0.01	0.06	0.06

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	34.8	0.0	34.9
Rough Terrain Forklift	20.9	0.0	20.9
Total	55.7	0.0	55.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	1	137	4	10
Jet A Fuel Truck	1	137	0.5	1.25
Water Truck	1	137	1	2.5
Offsite				
Flat Bed Truck/Trailer	1	10	N/A	60
Concrete Mixer Truck	1	10	N/A	10
Jet A Fuel Truck	1	137	N/A	20
Water Truck	1	137	N/A	20
Worker Commute	4	137	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Flat Bed Truck/Trailer	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Jet A Fuel Truck	0.00	0.01	0.01	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.02	0.10	0.14	0.00	0.01	0.01
Offsite						
Flat Bed Truck/Trailer	0.06	0.36	0.37	0.00	0.02	0.01
Concrete Mixer Truck	0.01	0.06	0.06	0.00	0.00	0.00
Jet A Fuel Truck	0.02	0.09	0.19	0.00	0.01	0.01
Water Truck	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.20	1.41	0.87	0.01	0.06	0.04
Total	0.22	1.51	1.02	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Truck, Semi Tractor	1.3	0.0	1.3
Jet A Fuel Truck	0.33	0.00	0.33
Water Truck	0.65	0.00	0.65
Onsite Total	4.1	0.0	4.1
Offsite			
Flat Bed Truck/Trailer	0.8	0.0	0.8
Concrete Mixer Truck	0.1	0.0	0.1
Jet A Fuel Truck	5.21	0.00	5.21
Water Truck	5.21	0.00	5.21
Worker Commute	16.6	0.0	16.6
Offsite Total	27.9	0.0	27.9
Total	32.0	0.0	32.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	1.237	0.124	12.37	1.24
Truck, Semi Tractor	1	Unpaved	5	2.145	0.214	10.72	1.07
Jet A Fuel Truck	1	Unpaved	1.25	2.145	0.214	2.68	0.27
Water Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Onsite Total						31.13	3.11
Offsite							
Flat Bed Truck/Trailer	1	Paved	60	0.001	0.000	0.05	0.00
Concrete Mixer Truck	1	Paved	10	0.001	0.000	0.01	0.00
Jet A Fuel Truck	1	Paved	20	0.00	0.00	0.02	0.00
Water Truck	1	Paved	20	0.00	0.00	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.28	0.00
Total						31.42	3.11

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.09	16.82	9.96	0.05	0.45	0.42	44.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	9.17	1.91	
Onsite Total	2.09	16.82	9.96	0.05	9.63	2.33	44.9
Offsite Motor Vehicle Exhaust	0.28	2.18	0.37	0.01	0.07	0.05	8.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	45.02	4.45	
Offsite Total	0.28	2.18	0.37	0.01	45.09	4.50	8.3
Total	2.37	19.00	10.34	0.05	54.71	6.83	53.1

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	24	6
Backhoe/Front Loader	125	1	24	8
Drum Type Compactor	100	1	24	6
Track Type Dozer	150	1	24	8
Excavator	250	1	24	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Track Type Dozer	0.66	5.81	3.56	0.01	0.19	0.18
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	2.09	16.82	9.96	0.05	0.45	0.42

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	11.2	0.0	11.3
Backhoe/Front Loader	8.8	0.0	8.8
Drum Type Compactor	3.9	0.0	3.9
Track Type Dozer	10.6	0.0	10.6
Excavator	10.4	0.0	10.4
Total	44.8	0.0	44.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	24	N/A	5
Water Truck	2	24	N/A	5
Lowboy Truck/Trailer	1	24	N/A	5
Worker Commute	10	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Lowboy Truck/Trailer	0.00	0.02	0.05	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.28	2.18	0.37	0.01	0.07	0.05
Total	0.28	2.18	0.37	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.5	0.0	0.5
Lowboy Truck/Trailer	0.2	0.0	0.2
Worker Commute	7.3	0.0	7.3
Offsite Total	8.3	0.0	8.3
Total	8.3	0.0	8.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Water Truck	2	Unpaved	5	2.145	0.214	21.45	2.14
Lowboy Truck/Trailer	1	Unpaved	5	2.145	0.214	10.72	1.07
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						45.02	4.45
Total						45.02	4.45

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	4,334	9.94E-04	2.07E-04	4.31	0.90
Bulldozing, Scraping and Grading	hr/day	14	0.348	0.072	4.87	1.01
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					9.17	1.91

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate 80,000 CY of cut plus 50,000 CY of fill yields 130,000 CY of soil handling over 30 days. Approx 4,334 CY/day.

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	28.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	--
Earthwork Fugitive PM	--	--	--	--	1.38	0.29	--
Onsite Total	1.15	15.80	7.68	0.03	1.62	0.51	28.5
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	4.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	--
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	4.4
Total	1.30	17.03	7.78	0.03	1.94	0.53	32.9

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	24	8
Grout Machine	60	1	24	8
Drill Rig	75	1	24	8
Transfer Pump	60	1	24	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	7.7	0.0	7.7
Grout Machine	7.0	0.0	7.0
Drill Rig	6.7	0.0	6.7
Transfer Pump	7.0	0.0	7.0
Total	28.5	0.0	28.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	4.4	0.0	4.4
Offsite Total	4.4	0.0	4.4
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	1,388	9.94E-04	2.07E-04	1.38	0.29
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					1.38	0.29

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Offsite Motor Vehicle Exhaust	0.27	2.03	0.63	0.01	0.07	0.05	1.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	105.11	10.47	
Offsite Total	0.27	2.03	0.63	0.01	105.18	10.52	1.4
Total	1.02	6.57	4.56	0.02	105.34	10.67	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	4	8
Rough Terrain Crane (L)	275	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Rough Terrain Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Rough Terrain Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.75	4.54	3.93	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.7	0.0	0.7
Rough Terrain Crane (L)	2.0	0.0	2.0
Total	2.6	0.0	2.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
1-Ton Flat Bed, 4x4	2	4	N/A	20
Flat Bed Truck/Trailer	1	4	N/A	20
Worker Commute	8	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHD	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
1-Ton Flat Bed, 4x4	0.04	0.24	0.25	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.27	2.03	0.63	0.01	0.07	0.05
Total	0.27	2.03	0.63	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
1-Ton Flat Bed, 4x4	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.2	0.0	0.2
Worker Commute	1.0	0.0	1.0
Offsite Total	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.ciimateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
1-Ton Flat Bed, 4x4	2	Unpaved	20	1.237	0.124	49.46	4.95
Flat Bed Truck/Trailer	1	Unpaved	20	2.145	0.214	42.90	4.29
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						105.11	10.47
Total						105.11	10.47

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Offsite Motor Vehicle Exhaust	0.13	0.97	0.22	0.00	0.03	0.02	0.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	49.27	4.91	
Offsite Total	0.13	0.97	0.22	0.00	49.30	4.93	0.6
Total	0.61	6.89	2.73	0.01	49.41	5.03	1.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	2	8
Backhoe/Front Loader	125	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Total	0.48	5.92	2.51	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.3	0.0	0.3
Backhoe/Front Loader	0.6	0.0	0.6
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	1	4	N/A	5
Dump Truck	1	2	N/A	20
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.00	0.03	0.03	0.00	0.00	0.00
Dump Truck	0.02	0.12	0.12	0.00	0.01	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.22	0.00	0.03	0.02
Total	0.13	0.97	0.22	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.0	0.0	0.0
Dump Truck	0.1	0.0	0.1
Worker Commute	0.5	0.0	0.5
Offsite Total	0.6	0.0	0.6
Total	0.6	0.0	0.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	1	Unpaved	5	1.237	0.124	6.18	0.62
Dump Truck	1	Unpaved	20	2.145	0.214	42.90	4.29
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						49.27	4.91
Total						49.27	4.91

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.73	13.83	6.02	0.05	0.23	0.21	53.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	--
Earthwork Fugitive PM	--	--	--	--	0.20	0.04	--
Onsite Total	1.73	13.83	6.02	0.05	0.43	0.26	53.6
Offsite Motor Vehicle Exhaust	0.28	2.10	0.64	0.01	0.08	0.05	10.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	107.06	10.66	--
Offsite Total	0.28	2.10	0.64	0.01	107.14	10.72	10.1
Total	2.01	15.93	6.66	0.06	107.57	10.97	63.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	30	7
Backhoe/Front Loader	125	1	30	10
Low Drill	385	1	16	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Low Drill	385	0.071	0.551	0.162	0.003	0.006	0.005	311.309	0.006	Bore/Drill Rigs

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.60	2.47	2.78	0.01	0.10	0.09
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Low Drill	0.71	5.51	1.62	0.03	0.06	0.05
Total	1.73	13.83	6.02	0.05	0.23	0.21

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	17.2	0.0	17.2
Backhoe/Front Loader	13.8	0.0	13.8
Low Drill	22.6	0.0	22.6
Total	53.5	0.0	53.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	30	N/A	5
Water Truck	1	30	N/A	5
Dump Truck	1	30	N/A	10
Concrete Mixer Truck	3	18	N/A	10
Worker Commute	9	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Concrete Mixer Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.24	1.85	0.16	0.01	0.05	0.03
Offsite Total	0.28	2.10	0.64	0.01	0.08	0.05
Total	0.28	2.10	0.64	0.01	0.08	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
Water Truck	0.3	0.0	0.3
Dump Truck	0.6	0.0	0.6
Concrete Mixer Truck	1.0	0.0	1.0
Worker Commute	8.2	0.0	8.2
Offsite Total	10.0	0.0	10.1
Total	10.0	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	5	1.012	0.101	10.12	1.01
Water Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Dump Truck	1	Unpaved	10	2.145	0.214	21.45	2.14
Concrete Mixer Truck	3	Unpaved	10	2.145	0.214	64.34	6.43
Worker Commute	9	Paved	60	0.001	0.000	0.43	0.00
Offsite Total						107.06	10.66
Total						107.06	10.66

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	200	9.94E-04	2.07E-04	0.20	0.04
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.20	0.04

^a From Table 57

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

^a Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^b Estimate

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	17.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	17.4
Total	1.30	17.03	7.78	0.03	0.56	0.24	122.1

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	96	8
Grout Machine	60	1	80	8
Drill Rig	75	1	96	8
Transfer Pump	60	1	80	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	0.042814	0.500686	0.28637	0.001746	0.0041623	PM2.5 (lb/hr) ^b	164.8678	0.003863	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	30.8	0.0	30.9
Grout Machine	23.5	0.0	23.5
Drill Rig	26.9	0.0	26.9
Transfer Pump	23.5	0.0	23.5
Total	104.6	0.0	104.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	96	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	17.4	0.0	17.4
Offsite Total	17.4	0.0	17.4
Total	17.4	0.0	17.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Offsite Motor Vehicle Exhaust	0.13	0.97	0.32	0.00	0.04	0.02	1.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	55.45	5.53	
Offsite Total	0.13	0.97	0.32	0.00	55.49	5.55	1.7
Total	0.31	3.62	0.90	0.01	55.51	5.57	3.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.18	2.65	0.59	0.01	0.02	0.02
Total	0.18	2.65	0.59	0.01	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	2	10	N/A	5
Flat Bed Truck/Trailer	1	10	N/A	20
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.32	0.00	0.04	0.02
Total	0.13	0.97	0.32	0.00	0.04	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	0.1	0.0	0.1
Flat Bed Truck/Trailer	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.7	0.0	1.7
Total	1.7	0.0	1.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Flat Bed Truck/Trailer	1	Unpaved	20	2.145	0.214	42.90	4.29
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						55.45	5.53
Total						55.45	5.53

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Offsite Motor Vehicle Exhaust	0.29	2.24	0.36	0.01	0.07	0.04	13.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	33.08	3.26	
Offsite Total	0.29	2.24	0.36	0.01	33.14	3.30	13.7
Total	0.98	8.03	3.96	0.02	33.29	3.44	38.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	40	6
RT Crane (M)	215	1	40	6
Compressor Trailer	60	1	40	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.70	5.79	3.60	0.02	0.14	0.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	6.1	0.0	6.1
RT Crane (M)	12.2	0.0	12.2
Compressor Trailer	6.8	0.0	6.8
Total	25.1	0.0	25.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	40	N/A	10
1-Ton Crew Cab Flat Bed, 4x4	2	40	N/A	5
Worker Commute	10	40	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.02	0.12	0.12	0.00	0.01	0.00
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.29	2.24	0.36	0.01	0.07	0.04
Total	0.29	2.24	0.36	0.01	0.07	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.0	0.0	1.0
1-Ton Crew Cab Flat Bed, 4x4	0.5	0.0	0.5
Worker Commute	12.1	0.0	12.1
Offsite Total	13.7	0.0	13.7
Total	13.7	0.0	13.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	10	1.012	0.101	20.23	2.02
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						33.08	3.26
Total						33.08	3.26

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Offsite Motor Vehicle Exhaust	0.38	2.91	0.67	0.01	0.09	0.06	15.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	83.19	8.26	
Offsite Total	0.38	2.91	0.67	0.01	83.29	8.32	15.2
Total	1.46	8.84	6.22	0.03	83.50	8.52	33.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	33	8
RT Crane (M)	215	1	22	6
RT Crane (L)	275	1	11	6

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
RT Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
RT Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	1.07	5.93	5.55	0.02	0.21	0.20

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	5.6	0.0	5.6
RT Crane (M)	6.7	0.0	6.7
RT Crane (L)	5.4	0.0	5.4
Total	17.7	0.0	17.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	3	33	N/A	15
1-Ton Crew Cab Flat Bed, 4x4	2	33	N/A	15
Worker Commute	12	33	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.04	0.27	0.28	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.31	2.47	0.21	0.01	0.07	0.05
Offsite Total	0.38	2.91	0.67	0.01	0.09	0.06
Total	0.38	2.91	0.67	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.9	0.0	1.9
1-Ton Crew Cab Flat Bed, 4x4	1.3	0.0	1.3
Worker Commute	12.0	0.0	12.0
Offsite Total	15.2	0.0	15.2
Total	15.2	0.0	15.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	3	Unpaved	15	1.012	0.101	45.52	4.55
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	15	1.237	0.124	37.10	3.71
Worker Commute	12	Paved	60	0.001	0.000	0.58	0.00
Offsite Total						83.19	8.26
Total						83.19	8.26

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29b

**500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.59	4.56	0.81	0.01	0.14	0.09	5.0
Offsite Helicopter Exhaust	0.23	2.42	1.54	0.00	0.07	0.07	1.36
Offsite Motor Vehicle Fugitive PM	--	--	--	--	93.83	9.29	
Offsite Total	0.82	6.98	2.35	0.02	94.04	9.44	6.4
Total	0.82	6.98	2.35	0.02	94.04	9.44	6.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	8	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.23	2.42	1.54	0.00	0.07	0.07

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	2	N/A	15
1-Ton Truck, 4x4	2	2	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	15
Worker Commute	20	8	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29b
500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Fuel, Helicopter Support Truck	0.01	0.09	0.09	0.00	0.00	0.00
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.59	4.56	0.81	0.01	0.14	0.09
Total	0.59	4.56	0.81	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.1	0.0	0.1
1-Ton Truck, 4x4	0.1	0.0	0.1
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	4.8	0.0	4.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	15	1.012	0.101	30.35	3.03
1-Ton Truck, 4x4	2	Unpaved	15	1.012	0.101	30.35	3.03
Fuel, Helicopter Support Truck	1	Unpaved	15	2.145	0.214	32.17	3.22
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						93.83	9.29
Total						93.83	9.29

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29c

**500 kV Transmission Line Construction Emissions
Tower Helicopter Operations**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Helicopter Exhaust	46.71	56.80	577.42	32.18	12.02	12.02	1626.43
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Offsite Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4
Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Kaman K-Max	1500	1	120	8
Hughes 500E Helicopter	317	1	127	12
Sikorsky S64	9000	1	7	12

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Kaman K-Max	1500	1.129	1.353	7.403	0.626	0.201	0.201	1978.170	0.055	See note c
Hughes 500E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039	0.019	See note c
Sikorsky S64	9000	1.786	2.088	47.051	2.464	0.966	0.966	7788.012	0.216	See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5, CO2, and CH4 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications,

DETEC, Federal Office of Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009.

Downloaded from <http://www.bazl.admin.ch/experten/regulation/03312/03419/03532/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.75 kg/gal from Table 13.1 of 2013 Climate Registry Default Emission Factors, downloaded from

<http://www.theclimateregistry.org/downloads/2013/01/2013-Climateregistry-Default-Emissions-Factors.pdf>

CH4 emission factor = 0.27 g/gal from Table 13.7 of 2013 Climate Registry Default Emission Factors

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Kaman K-Max	9.03	10.83	59.22	5.01	1.60	1.60
Hughes 500E Helicopter	25.27	31.74	12.80	2.61	0.42	0.42
Sikorsky S64	21.44	25.06	564.62	29.57	11.60	11.60
Total^b	46.71	56.80	577.42	32.18	12.02	12.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

^b Total daily emissions assume that the Kaman K-Max and Sikorsky S64 would not operate on the same day.

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Kaman K-Max	861.4	0.0	861.9
Hughes 500E Helicopter	467.3	0.0	467.6
Sikorsky S64	296.7	0.0	296.9
Total	1,625.5	0.0	1,626.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO2-equivalent (CO2e) emission factors are CO2 emissions plus 21 x CH4 emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
None				

^a Onsite travel based on 25% use at 10 mph average speed.

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
1-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
Fuel, Helicopter Support Truck	0.00	0.00	0.00	0.00	0.00	0.00
Worker Commute	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
1-Ton Truck, 4x4	0.0	0.0	0.0
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	0.0	0.0	0.0
Offsite Total	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^b Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
None						0.00	0.00
Offsite Total						0.00	0.00
Total						0.00	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	5.93	32.28	29.00	0.15	1.00	0.92	0.00
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	5.93	32.28	29.00	0.15	1.00	0.92	0.0
Offsite Motor Vehicle Exhaust	1.70	12.93	3.12	0.04	0.42	0.29	18.5
Offsite Helicopter Exhaust	12.64	15.87	6.40	1.31	0.21	0.21	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	382.11	37.94	
Offsite Total	14.34	28.80	9.52	1.35	382.75	38.45	18.5
Total	20.27	61.08	38.52	1.51	383.75	39.37	18.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	2	9	8
RT Crane (M)	215	2	9	6
Boom/Crane Truck	350	2	9	6
Spacing Cart	10	2	3	8
Static Truck/Tensioner	350	1	9	6
3 Drum Straw Sock Puller	300	1	4	6
Bull Wheel Puller	525	1	5	6
Sag Cat w/ winches	350	2	9	4
Backhoe/Front Loader	125	1	9	4
D8 Cat	350	2	9	4
Hughes 500 E Helicopter	N/A	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Spacing Cart	10	0.012	0.062	0.074	0.000	0.003	0.003	10.107	0.001	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Sock Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Bull Wheel Puller	525	0.044	0.347	0.202	0.001	0.007	0.006	122.505	0.004	Other Construction Equipment
Sag Cat w/ winches	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
D8 Cat	350	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Hughes 500 E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039		See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5 and CO2 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications, DETEC, Federal Office of

Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009. Downloaded from <http://www.bazl.admin.ch/fachleute/01169/01174/01628/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet-A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.57 kg/gal from Table C.3 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008.

Downloaded from http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.93	5.94	5.86	0.03	0.17	0.16
RT Crane (M)	0.65	2.78	3.25	0.02	0.11	0.10
Boom/Crane Truck	1.03	4.24	4.77	0.02	0.18	0.16
Spacing Cart	0.19	0.99	1.18	0.00	0.05	0.04
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
3 Drum Straw Sock Puller	0.48	2.76	1.82	0.01	0.06	0.05
Bull Wheel Puller	0.27	2.08	1.21	0.01	0.04	0.04
Sag Cat w/ winches	0.63	3.68	2.43	0.02	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
D8 Cat	1.11	4.70	6.02	0.02	0.22	0.21
Hughes 500 E Helicopter	12.64	15.87	6.40	1.31	0.21	0.21
Total	18.56	48.15	35.40	1.46	1.21	1.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	13.9	0.0	13.9
RT Crane (M)	5.5	0.0	5.5
Boom/Crane Truck	8.8	0.0	8.8
Spacing Cart	0.2	0.0	0.2
Static Truck/Tensioner	6.2	0.0	6.2
3 Drum Straw Sock Puller	2.8	0.0	2.8
Bull Wheel Puller	1.7	0.0	1.7
Sag Cat w/ winches	8.3	0.0	8.3
Backhoe/Front Loader	1.7	0.0	1.7
D8 Cat	8.5	0.0	8.5
Hughes 500 E Helicopter	3.7	0.0	3.7
Total	61.2	0.0	61.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	4	9	N/A	20
1-Ton Crew Cab, 4x4	6	9	N/A	20
Wire Truck/Trailer	4	6	N/A	5
Dump Truck	1	9	N/A	5
Lowboy Truck/Trailer	3	9	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	30
Worker Commute	55	9	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Fuel, Helicopter Support Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.07	0.48	0.49	0.00	0.02	0.02
1-Ton Crew Cab, 4x4	0.11	0.71	0.74	0.00	0.03	0.03
Wire Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Dump Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.04	0.19	0.42	0.00	0.02	0.02
Fuel, Helicopter Support Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	1.44	11.31	0.95	0.04	0.32	0.21
Offsite Total	1.70	12.93	3.12	0.04	0.42	0.29
Total	1.70	12.93	3.12	0.04	0.42	0.29

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.9	0.0	0.9
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Wire Truck/Trailer	0.2	0.0	0.2
Dump Truck	0.1	0.0	0.1
Lowboy Truck/Trailer	0.8	0.0	0.8
Fuel, Helicopter Support Truck	0.1	0.0	0.1
Worker Commute	15.0	0.0	15.0
Offsite Total	18.5	0.0	18.5
Total	18.5	0.0	18.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	4	Unpaved	20	1.012	0.101	80.93	8.09
1-Ton Crew Cab, 4x4	6	Unpaved	20	1.237	0.124	148.39	14.84
Wire Truck/Trailer	4	Unpaved	5	2.145	0.214	42.90	4.29
Dump Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Lowboy Truck/Trailer	3	Unpaved	15	2.145	0.214	96.51	9.65
Fuel, Helicopter Support Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	55	Paved	60	0.001	0.000	2.64	0.00
Offsite Total						382.11	37.94
Total						382.11	37.94

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.75	4.42	0.02	0.19	0.17	3.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	2.58	0.54	
Onsite Total	0.87	6.75	4.42	0.02	2.77	0.71	3.3
Offsite Motor Vehicle Exhaust	0.20	1.56	0.32	0.01	0.05	0.03	1.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	44.87	4.45	
Offsite Total	0.20	1.56	0.32	0.01	44.92	4.49	1.0
Total	1.08	8.31	4.75	0.03	47.70	5.20	4.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	4	6
Backhoe/Front Loader	125	1	4	4
Drum Type Compactor	100	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.87	6.75	4.42	0.02	0.19	0.17

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	1.9	0.0	1.9
Backhoe/Front Loader	0.7	0.0	0.7
Drum Type Compactor	0.6	0.0	0.6
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
Water Truck	1	4	N/A	5
Lowboy Truck/Trailer	1	4	N/A	10
Worker Commute	7	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.01	0.04	0.09	0.00	0.00	0.00
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.20	1.56	0.32	0.01	0.05	0.03
Total	0.20	1.56	0.32	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
Water Truck	0.0	0.0	0.0
Lowboy Truck/Trailer	0.1	0.0	0.1
Worker Commute	0.8	0.0	0.8
Offsite Total	1.0	0.0	1.0
Total	1.0	0.0	1.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	1.237	0.124	12.37	1.24
Water Truck	1	Unpaved	5	2.145	0.214	10.72	1.07
Lowboy Truck/Trailer	1	Unpaved	10	2.145	0.214	21.45	2.14
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						44.87	4.45
Total						44.87	4.45

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day	6	0.348	0.072	2.09	0.43
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					2.58	0.54

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.12	0.96	0.08	0.00	0.03	0.02	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5
Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	18	8	20
Worker Commute	4	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.02	0.14	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.12	0.96	0.08	0.00	0.03	0.02
Total	0.12	0.96	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.4	0.0	0.4
Worker Commute	2.2	0.0	2.2
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	20	0.001	0.000	0.03	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.25	2.45	0.98	0.01	0.04	0.03	92.9
Onsite Motor Vehicle Exhaust	0.01	0.08	0.11	0.00	0.01	0.00	8.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	23.09	2.31	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.26	2.53	1.09	0.01	23.13	2.35	101.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	44.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	44.2
Total	0.36	3.35	1.16	0.01	23.35	2.36	145.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	365	2
Rough Terrain Forklift	125	1	365	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.11	0.46	0.54	0.00	0.02	0.02
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.25	2.45	0.98	0.01	0.04	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	37.1	0.0	37.2
Rough Terrain Forklift	55.7	0.0	55.7
Total	92.8	0.0	92.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4	1	365	4	10
Truck, Semi Tractor	1	365	2	5
Offsite				
Worker Commute	4	365	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Truck, Semi Tractor	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Onsite Total	0.01	0.08	0.11	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.90	0.18	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	4.8	0.0	4.8
Truck, Semi Tractor	3.5	0.0	3.5
Onsite Total	8.2	0.0	8.2
Offsite			
Worker Commute	44.1	0.0	44.2
Offsite Total	44.1	0.0	44.2
Total	52.4	0.0	52.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	1.237	0.124	12.37	1.24
Truck, Semi Tractor	1	Unpaved	5	2.145	0.214	10.72	1.07
Onsite Total						23.09	2.31
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						23.28	2.31

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.60	12.73	7.49	0.04	0.34	0.31	109.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	2.14	0.21	
Earthwork Fugitive PM	--	--	--	--	3.58	0.74	
Onsite Total	1.60	12.73	7.50	0.04	6.06	1.27	109.5
Offsite Motor Vehicle Exhaust	0.18	1.34	0.55	0.01	0.05	0.04	19.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.18	1.34	0.55	0.01	0.34	0.04	19.3
Total	1.79	14.07	8.05	0.04	6.40	1.31	128.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	88	4
Backhoe/Front Loader	125	1	88	6
Drum Type Compactor	100	1	88	4
Track Type Dozer	150	1	88	6
Excavator	250	1	44	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.31	1.42	1.46	0.01	0.05	0.05
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.16	1.52	1.06	0.00	0.05	0.05
Track Type Dozer	0.49	4.36	2.67	0.01	0.14	0.13
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	1.60	12.73	7.49	0.04	0.34	0.31

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	27.5	0.0	27.5
Backhoe/Front Loader	24.3	0.0	24.3
Drum Type Compactor	9.4	0.0	9.4
Track Type Dozer	29.0	0.0	29.1
Excavator	19.0	0.0	19.0
Total	109.2	0.0	109.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	88	8	1
Offsite				
1-Ton Crew Cab, 4x4	1	88	N/A	30
Lowboy Truck/Trailer	1	44	N/A	30
Worker Commute	5	88	N/A	60

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.13	1.03	0.09	0.00	0.03	0.02
Offsite Total	0.18	1.34	0.55	0.01	0.05	0.04
Total	0.18	1.34	0.56	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab, 4x4	3.5	0.0	3.5
Lowboy Truck/Trailer	2.5	0.0	2.5
Worker Commute	13.3	0.0	13.3
Offsite Total	19.3	0.0	19.3
Total	19.4	0.0	19.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	2.145	0.214	2.14	0.21
Onsite Total						2.14	0.21
Offsite							
1-Ton Crew Cab, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	5	Paved	60	0.001	0.000	0.24	0.00
Offsite Total						0.29	0.00
Total						2.43	0.21

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	100	9.94E-04	2.07E-04	0.10	0.02
Bulldozing, Scraping and Grading	hr/day	10	0.348	0.072	3.48	0.72
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					3.58	0.74

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Offsite Motor Vehicle Exhaust	0.26	1.90	0.94	0.01	0.07	0.05	9.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.26	1.90	0.94	0.01	0.46	0.05	9.3
Total	1.61	10.08	7.33	0.05	0.69	0.27	53.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	26	6
Auger Truck	210	1	26	6
Boom/Crane Truck	350	1	26	8
Bucket Truck	250	1	26	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.17	1.81	1.16	0.00	0.05	0.05
Auger Truck	0.26	2.06	0.59	0.01	0.02	0.02
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.35	8.18	6.39	0.04	0.23	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	3.3	0.0	3.3
Auger Truck	13.3	0.0	13.3
Boom/Crane Truck	17.0	0.0	17.0
Bucket Truck	10.0	0.0	10.0
Total	43.7	0.0	43.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Pick-up Truck, 4x4	2	26	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	26	N/A	30
Extendable Flat Bed Pole Truck	1	26	N/A	30
Worker Commute	6	26	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Pick-up Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Pick-up Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.26	1.90	0.94	0.01	0.07	0.05
Total	0.26	1.90	0.94	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Pick-up Truck, 4x4	2.0	0.0	2.0
1-Ton Crew Cab Flat Bed, 4x4	1.0	0.0	1.0
Extendable Flat Bed Pole Truck	1.5	0.0	1.5
Worker Commute	4.7	0.0	4.7
Offsite Total	9.3	0.0	9.3
Total	9.3	0.0	9.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Pick-up Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.38	0.00
Total						0.38	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	7.3
Total	1.07	7.58	4.97	0.02	0.60	0.20	24.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	23	4
Boom/Crane Truck	350	1	23	6
Compressor Trailer	60	1	23	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.09	1.32	0.29	0.00	0.01	0.01
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.84	5.86	4.22	0.02	0.17	0.16

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.3	0.0	2.3
Boom/Crane Truck	11.3	0.0	11.3
Compressor Trailer	3.9	0.0	3.9
Total	17.5	0.0	17.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	23	N/A	30
Flat Bed Truck/Trailer	1	23	N/A	30
Worker Commute	6	23	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Flat Bed Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Flat Bed Truck/Trailer	1.3	0.0	1.3
Worker Commute	4.2	0.0	4.2
Offsite Total	7.3	0.0	7.3
Total	7.3	0.0	7.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Flat Bed Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	2.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	2.0
Total	0.98	5.99	4.23	0.02	0.69	0.18	5.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	5	5
Boom/Crane Truck	350	1	5	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.5	0.0	0.5
Boom/Crane Truck	2.5	0.0	2.5
Total	3.0	0.0	3.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Truck, 4x4	2	5	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	5	N/A	30
Worker Commute	8	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.4	0.0	0.4
1-Ton Crew Cab Flat Bed, 4x4	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.11	9.18	4.06	0.03	0.16	0.15	119.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	2.14	0.21	
Earthwork Fugitive PM	--	--	--	--	0.03	0.01	
Onsite Total	1.11	9.18	4.07	0.03	2.34	0.37	119.2
Offsite Motor Vehicle Exhaust	0.31	2.14	1.43	0.01	0.11	0.08	40.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.31	2.14	1.43	0.01	0.49	0.08	40.7
Total	1.41	11.32	5.50	0.05	2.83	0.44	159.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	96	5
Backhoe/Front Loader	125	1	96	8
Auger Truck	210	1	65	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.43	1.77	1.99	0.01	0.07	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Auger Truck	0.34	2.74	0.78	0.02	0.03	0.03
Total	1.11	9.18	4.06	0.03	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	39.2	0.0	39.2
Backhoe/Front Loader	35.3	0.0	35.3
Auger Truck	44.4	0.0	44.4
Total	118.9	0.0	119.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	96	8	1
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	1	96	N/A	30
Dump Truck	1	96	N/A	30
Concrete Mixer Truck	3	65	N/A	30
Worker Commute	7	96	N/A	60

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Concrete Mixer Truck	0.07	0.39	0.84	0.00	0.04	0.03
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.31	2.14	1.43	0.01	0.11	0.08
Total	0.31	2.14	1.43	0.01	0.11	0.08

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	3.8	0.0	3.8
Dump Truck	5.5	0.0	5.5
Concrete Mixer Truck	11.1	0.0	11.1
Worker Commute	20.3	0.0	20.3
Offsite Total	40.7	0.0	40.7
Total	40.9	0.0	40.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	2.145	0.214	2.14	0.21
Onsite Total						2.14	0.21
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.38	0.00
Total						2.53	0.21

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	35	9.94E-04	2.07E-04	0.03	0.01
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.03	0.01

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	32.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	32.8
Total	0.70	3.43	3.10	0.02	0.41	0.12	95.6

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	128	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.51	2.12	2.39	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	62.7	0.0	62.8
Total	62.7	0.0	62.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	128	N/A	30
40' Flat Bed Pole Truck	1	128	N/A	30
Worker Commute	4	128	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
40' Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
40' Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	10.0	0.0	10.0
40' Flat Bed Pole Truck	7.3	0.0	7.3
Worker Commute	15.5	0.0	15.5
Offsite Total	32.8	0.0	32.8
Total	32.8	0.0	32.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
40' Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Offsite Motor Vehicle Exhaust	0.73	5.39	2.11	0.02	0.20	0.14	83.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.15	0.00	
Offsite Total	0.73	5.39	2.11	0.02	1.36	0.14	83.2
Total	5.07	29.37	24.43	0.15	2.08	0.80	541.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	4	89	8
Boom/Crane Truck	350	2	89	8
Splicing Rig	350	1	20	2
3 Drum Straw Line Puller	300	1	45	6
Static Truck/Tensioner	350	1	45	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Splicing Rig	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Line Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	1.86	11.87	11.71	0.07	0.35	0.32
Boom/Crane Truck	1.37	5.66	6.36	0.03	0.23	0.21
Splicing Rig	0.16	0.92	0.61	0.00	0.02	0.02
3 Drum Straw Line Puller	0.48	2.76	1.82	0.01	0.06	0.05
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
Total	4.34	23.98	22.32	0.13	0.72	0.66

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	275.0	0.0	275.1
Boom/Crane Truck	116.3	0.0	116.4
Splicing Rig	4.6	0.0	4.6
3 Drum Straw Line Puller	31.1	0.0	31.2
Static Truck/Tensioner	31.1	0.0	31.2
Total	458.2	0.0	458.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	89	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	3	89	N/A	30
Wire Truck/Trailer	2	60	N/A	30
Dump Truck	1	89	N/A	30
Worker Commute	20	89	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.08	0.54	0.55	0.00	0.03	0.02
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.73	5.39	2.11	0.02	0.20	0.14
Total	0.73	5.39	2.11	0.02	0.20	0.14

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	7.0	0.0	7.0
1-Ton Crew Cab Flat Bed, 4x4	10.5	0.0	10.5
Wire Truck/Trailer	6.9	0.0	6.9
Dump Truck	5.1	0.0	5.1
Worker Commute	53.8	0.0	53.8
Offsite Total	83.2	0.0	83.2
Total	83.2	0.0	83.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	3	Paved	30	0.001	0.000	0.07	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						1.15	0.00
Total						1.15	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.92	12.58	7.81	0.05	0.29	0.27	10.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.80	0.17	
Onsite Total	1.92	12.58	7.81	0.05	1.09	0.43	10.0
Offsite Motor Vehicle Exhaust	0.70	5.00	2.80	0.02	0.23	0.17	5.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.10	0.00	
Offsite Total	0.70	5.00	2.80	0.02	1.34	0.17	5.3
Total	2.63	17.58	10.62	0.07	2.43	0.60	15.3

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	250	1	5	10
Crane (L)	500	1	5	10
Backhoe/Front Loader	125	1	5	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators
Crane (L)	500	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.65	3.21	2.22	0.02	0.07	0.07
Crane (L)	0.86	3.54	3.98	0.02	0.15	0.13
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Total	1.92	12.58	7.81	0.05	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	3.6	0.0	3.6
Crane (L)	4.1	0.0	4.1
Backhoe/Front Loader	2.3	0.0	2.3
Total	10.0	0.0	10.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	5	N/A	50
Water Truck	1	5	N/A	25
Concrete Mixer Truck	3	5	N/A	25
Dump Truck	3	5	N/A	25
Lowboy Truck/Trailer	1	5	N/A	25
Flat Bed Truck/Trailer	3	5	N/A	25
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

1-Ton Crew Cab, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.06	0.32	0.70	0.00	0.04	0.03
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.70	5.00	2.80	0.02	0.23	0.17
Total	0.70	5.00	2.80	0.02	0.23	0.17

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.2	0.0	0.2
Concrete Mixer Truck	0.7	0.0	0.7
Dump Truck	0.7	0.0	0.7
Lowboy Truck/Trailer	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.7	0.0	0.7
Worker Commute	2.5	0.0	2.5
Offsite Total	5.3	0.0	5.3
Total	5.3	0.0	5.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Flat Bed Truck/Trailer	3	Paved	25	0.001	0.000	0.06	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.10	0.00
Total						1.10	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	49.28	9.94E-04	2.07E-04	0.05	0.01

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.017	44.0	9.15	0.75	0.16
Total					0.80	0.17

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling volume based on a vault size of approximately 24 feet long, 14 feet wide, 12 feet deep. Approximately 0.33 vaults built per day. 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day

Storage pile size based on a 1 vault volume of 4032 cubic feet of soil. Storage pile assumed maximum 48 feet long, 14 feet wide, 6 feet high. 48 feet x 14 feet = 720 square feet = 0.017 acres

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.71	8.86	3.54	0.02	0.16	0.15	10.1
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	1.37	0.28	
Onsite Total	0.71	8.86	3.54	0.02	1.53	0.43	10.1
Offsite Motor Vehicle Exhaust	0.68	4.89	2.57	0.02	0.22	0.16	7.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.08	0.00	
Offsite Total	0.68	4.89	2.57	0.02	1.31	0.16	7.5
Total	1.39	13.75	6.11	0.04	2.84	0.59	17.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe/Front Loader	125	1	15	10
Compressor Trailer	60	1	15	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Compressor Trailer	0.29	3.02	1.93	0.01	0.09	0.08
Total	0.71	8.86	3.54	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe/Front Loader	6.9	0.0	6.9
Compressor Trailer	3.2	0.0	3.2
Total	10.1	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
Lowboy Truck/Trailer	1	15	N/A	25
1-Ton Truck, 4x4	2	15	N/A	50
Water Truck	1	15	N/A	25
Pipe Truck/Trailer	1	15	N/A	25
Concrete Mixer Truck	3	15	N/A	25
Dump Truck	3	15	N/A	25
Lowboy Truck/Trailer	1	1	N/A	25
Worker Commute	20	1	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Pipe Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Pipe Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.68	4.89	2.57	0.02	0.22	0.16
Total	0.68	4.89	2.57	0.02	0.22	0.16

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
Lowboy Truck/Trailer	0.7	0.0	0.7
1-Ton Truck, 4x4	0.8	0.0	0.8
Water Truck	0.5	0.0	0.5
Pipe Truck/Trailer	0.7	0.0	0.7
Concrete Mixer Truck	2.1	0.0	2.1
Dump Truck	2.1	0.0	2.1
Lowboy Truck/Trailer	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	7.5	0.0	7.5
Total	7.5	0.0	7.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Pipe Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.08	0.00
Total						1.08	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	92.28	9.94E-04	2.07E-04	0.09	0.02
Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.029	44.0	9.15	1.28	0.27
Total					1.37	0.28

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling cubic yards/day based on approximately 250 feet of trenching per day, 24 inches wide x 60 inches deep. 83 yards x 0.867 yards x 1.667 yards = 92.28 cubic yards/day

Storage pile acres based on approximately 250 feet of trenching per day, 60 inches wide x 24 inches high. 83 yards x 1.667 yards = 138.361 square yards = 0.029 acres

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Offsite Motor Vehicle Exhaust	0.53	4.03	0.88	0.01	0.14	0.09	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.93	0.00	
Offsite Total	0.53	4.03	0.88	0.01	1.06	0.09	3.3
Total	3.51	19.09	13.63	0.09	1.50	0.50	94.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	25	10
Manlift/Bucket Truck	250	1	25	10
Puller	350	1	25	10
Static Truck/Tensioner	350	1	25	10

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Manlift/Bucket Truck	250	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Puller	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.86	3.54	3.98	0.02	0.15	0.13
Manlift/Bucket Truck	0.54	2.32	2.71	0.01	0.09	0.09
Puller	0.79	4.61	3.03	0.02	0.10	0.09
Static Truck/Tensioner	0.79	4.61	3.03	0.02	0.10	0.09
Total	2.99	15.06	12.75	0.08	0.44	0.40

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	20.4	0.0	20.4
Manlift/Bucket Truck	12.7	0.0	12.7
Puller	28.8	0.0	28.8
Static Truck/Tensioner	28.8	0.0	28.8
Total	90.8	0.0	90.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/ Veh.
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	5	N/A	50
Wire Truck/Trailer	2	5	N/A	30
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.53	4.03	0.88	0.01	0.14	0.09
Total	0.53	4.03	0.88	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.3	0.0	0.3
Wire Truck/Trailer	0.6	0.0	0.6
Worker Commute	2.5	0.0	2.5
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^b Emission factors are in Table 54 and Table 55

^c CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						0.93	0.00
Total						0.93	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	5.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	5.7
Total	1.50	9.66	7.71	0.04	0.69	0.29	29.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	2	18	6
Boom/Crane Truck	350	1	18	8
Bucket Truck	250	1	18	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.35	3.63	2.31	0.01	0.11	0.10
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.27	7.94	6.96	0.03	0.27	0.25

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	4.6	0.0	4.6
Boom/Crane Truck	11.8	0.0	11.8
Bucket Truck	7.0	0.0	7.0
Total	23.3	0.0	23.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	1	18	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	18	N/A	30
Extendable Flat Bed Pole Truck	1	18	N/A	30
Worker Commute	6	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a	(lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.7	0.0	0.7
1-Ton Crew Cab Flat Bed, 4x4	0.7	0.0	0.7
Extendable Flat Bed Pole Truck	1.0	0.0	1.0
Worker Commute	3.3	0.0	3.3
Offsite Total	5.7	0.0	5.7
Total	5.7	0.0	5.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.96	7.91	4.75	0.02	0.20	0.19	16.3
Onsite Motor Vehicle Exhaust	0.00	0.01	0.03	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	6.43	0.64	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.96	7.93	4.78	0.02	6.64	0.83	16.4
Offsite Motor Vehicle Exhaust	0.26	1.93	0.77	0.01	0.07	0.05	6.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.41	0.00	
Offsite Total	0.26	1.93	0.77	0.01	0.48	0.05	6.3
Total	1.22	9.85	5.55	0.03	7.12	0.88	22.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	18	6
Backhoe/Front Loader	125	1	18	6
Drum Type Compactor	100	1	18	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.96	7.91	4.75	0.02	0.20	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	8.4	0.0	8.4
Backhoe/Front Loader	5.0	0.0	5.0
Drum Type Compactor	2.9	0.0	2.9
Total	16.3	0.0	16.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	18	8	3
Offsite				
1-Ton Crew Cab, 4x4	2	18	N/A	30
Lowboy Truck/Trailer	1	18	N/A	30
Worker Commute	7	18	N/A	60

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.01	0.03	0.00	0.00	0.00
Onsite Total	0.00	0.01	0.03	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.26	1.93	0.77	0.01	0.07	0.05
Total	0.26	1.94	0.80	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Lowboy Truck/Trailer	1.0	0.0	1.0
Worker Commute	3.8	0.0	3.8
Offsite Total	6.2	0.0	6.3
Total	6.4	0.0	6.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	3	2.145	0.214	6.43	0.64
Onsite Total						6.43	0.64
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.41	0.00
Total						6.84	0.64

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 45
Telecommunications Construction
Tower Foundation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.53	6.74	3.59	0.01	0.11	0.10	2.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.50	0.10	
Onsite Total	0.53	6.74	3.59	0.01	0.61	0.21	2.4
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	1.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	1.3
Total	0.71	8.05	4.31	0.02	0.93	0.25	3.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	5	8
Concrete Mixer	120	1	5	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Concrete Mixer	120	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final--Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Concrete Mixer	0.30	4.04	2.18	0.01	0.07	0.06
Total	0.53	6.74	3.59	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	0.9	0.0	0.9
Concrete Mixer	1.5	0.0	1.5
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	5	N/A	30
Stake Truck	1	5	N/A	30
Worker Commute	4	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 45
Telecommunications Construction
Tower Foundation

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Stake Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Stake Truck	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	1.3	0.0	1.3
Total	1.3	0.0	1.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Stake Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.50	0.10

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 46
Telecommunications Construction
Tower Construction

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Offsite Motor Vehicle Exhaust	0.16	1.18	0.44	0.00	0.04	0.03	6.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.24	0.00	
Offsite Total	0.16	1.18	0.44	0.00	0.28	0.03	6.0
Total	0.99	5.82	4.82	0.02	0.45	0.18	29.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Crane	300	1	30	8
150-Foot Lift Truck	100	1	30	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Crane	300	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Crane	0.69	2.83	3.18	0.01	0.12	0.11
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.83	4.64	4.38	0.02	0.17	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Crane	19.6	0.0	19.6
150-Foot Lift Truck	4.1	0.0	4.1
Total	23.8	0.0	23.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	30	N/A	30
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 46
Telecommunications Construction
Tower Construction

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.16	1.18	0.44	0.00	0.04	0.03
Total	0.16	1.18	0.44	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	2.4	0.0	2.4
Worker Commute	3.6	0.0	3.6
Offsite Total	6.0	0.0	6.0
Total	6.0	0.0	6.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.24	0.00
Total						0.24	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 47
Telecommunications Construction
Dish Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	1.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	1.6
Total	0.27	2.81	1.45	0.01	0.30	0.07	3.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Lift Truck	100	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.14	1.81	1.20	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Lift Truck	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	10	N/A	30
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 47
Telecommunications Construction
Dish Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.6	0.0	1.6
Total	1.6	0.0	1.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 48
Telecommunications Construction
Control Building

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Offsite Motor Vehicle Exhaust	0.08	0.59	0.22	0.00	0.02	0.01	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.12	0.00	
Offsite Total	0.08	0.59	0.22	0.00	0.14	0.01	2.5
Total	0.54	3.56	3.15	0.02	0.23	0.09	21.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	25	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	19.3	0.0	19.3
Total	19.3	0.0	19.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	25	N/A	30
Worker Commute	2	25	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 48
Telecommunications Construction
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.59	0.22	0.00	0.02	0.01
Total	0.08	0.59	0.22	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	1.0	0.0	1.0
Worker Commute	1.5	0.0	1.5
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.12	0.00
Total						0.12	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 49
Telecommunications Construction
Overhead Communications Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	5.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	5.0
Total	0.60	3.97	3.18	0.02	0.33	0.10	28.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	31	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	23.9	0.0	24.0
Total	23.9	0.0	24.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Reel Truck	1	31	N/A	30
Worker Commute	4	31	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Reel Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 49
Telecommunications Construction
Overhead Communications Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Reel Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Reel Truck	1.2	0.0	1.2
Worker Commute	3.7	0.0	3.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Reel Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.08	0.62	0.05	0.00	0.02	0.01	0.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.14	0.00	
Offsite Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9
Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

a From Table 53

b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Van	2	10	N/A	30
Worker Commute	2	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Van	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Van	0.03	0.21	0.02	0.00	0.01	0.00
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.62	0.05	0.00	0.02	0.01
Total	0.08	0.62	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Van	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	0.9	0.0	0.9
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Van	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.14	0.00
Total						0.14	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.32	1.84	1.21	0.01	0.04	0.04	13.8
Onsite Motor Vehicle Exhaust	0.03	0.21	0.22	0.00	0.01	0.01	1.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	35.40	3.54	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.35	2.05	1.43	0.01	35.45	3.58	15.2
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	3.6
Total	0.45	2.87	1.50	0.01	35.67	3.60	18.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
1-Ton Truck	300	1	30	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
1-Ton Truck	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
1-Ton Truck	0.32	1.84	1.21	0.01	0.04	0.04
Total	0.32	1.84	1.21	0.01	0.04	0.04

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
1-Ton Truck	13.8	0.0	13.8
Total	13.8	0.0	13.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Truck, 4x4	3	30	4	10
Van	1	30	2	5
Offsite				
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Van	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Van	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.03	0.21	0.22	0.00	0.01	0.01
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.14	1.03	0.28	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Truck, 4x4	1.2	0.0	1.2
Van	0.2	0.0	0.2
Onsite Total	1.4	0.0	1.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Truck, 4x4	3	Unpaved	10	1.012	0.101	30.35	3.03
Van	1	Unpaved	5	1.012	0.101	5.06	0.51
Onsite Total						35.40	3.54
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						35.60	3.54

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 51b

Additional Substation Construction Emissions

Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO ₂ e (MT)
Construction Equipment Exhaust	0.78	9.91	3.89	0.02	0.14	0.12	7.4
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	10.72	1.07	
Earthwork Fugitive PM	--	--	--	--	0.02	0.00	
Onsite Total	0.78	9.93	3.94	0.02	10.89	1.20	7.5
Offsite Motor Vehicle Exhaust	0.38	2.47	2.36	0.01	0.16	0.11	4.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.38	2.47	2.36	0.01	0.49	0.11	4.4
Total	1.16	12.41	6.30	0.03	11.38	1.32	11.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator with Auger Attachment	152	1	10	8
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4
Forklift	83	1	10	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO ₂ (lb/hr) ^a	CH ₄ (lb/hr) ^a	Category
Excavator with Auger Attachment	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator with Auger Attachment	0.41	5.31	1.59	0.01	0.07	0.07
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.78	9.91	3.89	0.02	0.14	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO ₂ (MT) ^a	CH ₄ (MT) ^a	CO ₂ e (MT) ^b
Excavator with Auger Attachment	4.1	0.0	4.1
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Forklift	0.0	0.0	0.0
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	4	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO ₂ (lb/mi) ^a	CH ₄ (lb/mi) ^a
Onsite									

Table 51b

Additional Substation Construction Emissions

Civil

Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Offsite										
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05	

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.19	1.03	2.24	0.01	0.12	0.09
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.38	2.47	2.36	0.01	0.16	0.11
Total	0.38	2.50	2.41	0.01	0.16	0.12

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	2.3	0.0	2.3
Worker Commute	2.1	0.0	2.1
Offsite Total	4.4	0.0	4.4
Total	4.5	0.0	4.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	2.145	0.214	5.36	0.54
Water Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Onsite Total						10.72	1.07
Offsite							
Concrete Truck	4	Paved	60	0.001	0.000	0.19	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						11.06	1.07

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	24	9.94E-04	2.07E-04	0.02	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.02	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated at 24 CY

Table 51c
Additional Substation Construction Emissions
Electrical

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.14	11.25	7.51	0.02	0.29	0.27	15.5
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.01	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	11.27	7.51	0.02	0.30	0.27	15.6
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	1.41	13.32	7.68	0.03	0.84	0.31	24.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	4	30	7
Reach Manlift	87	2	30	6
15-Ton Crane	125	2	5	5

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.47	3.78	3.41	0.01	0.10	0.09
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.46	4.74	2.30	0.01	0.12	0.11
Total	1.14	11.25	7.51	0.02	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	7.5	0.0	7.5
Reach Manlift	6.2	0.0	6.2
15-Ton Crane	1.8	0.0	1.8
Total	15.5	0.0	15.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	10	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 51c
Additional Substation Construction Emissions
Electrical

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.08	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.2	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	10	Paved	0.625	0.001	0.000	0.01	0.00
Onsite Total						0.01	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.49	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51d

Additional Substation Construction Emissions
Wiring

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.17	1.90	1.38	0.00	0.05	0.05	3.6
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.17	1.92	1.39	0.00	0.06	0.05	3.7
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	0.44	3.97	1.56	0.01	0.59	0.09	12.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Reach Manlift	87	2	30	3
Manlift	43	1	15	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

<http://www.aqmd.gov/ceqa/handbook/PM2.5/PM2.5.html>

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Reach Manlift	0.11	1.36	0.90	0.00	0.04	0.03
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.17	1.90	1.38	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Reach Manlift	3.1	0.0	3.1
Manlift	0.5	0.0	0.5
Total	3.6	0.0	3.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	8	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51d

Additional Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.07	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.1	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	8	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51e
Additional Substation Construction Emissions
Testing

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	2.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	2.4
Total	0.11	0.83	0.07	0.00	0.22	0.02	2.4

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

a From Table 53
 b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	20	0.25	0.625
Offsite				
Worker Commute	4	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51e
Additional Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.83	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	2.4	0.0	2.4
Offsite Total	2.4	0.0	2.4
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						0.19	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	3.77	1.90	0.01	0.05	0.05	3.3
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	10.72	1.07	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	0.30	3.79	1.95	0.01	10.92	1.15	3.4
Offsite Motor Vehicle Exhaust	0.28	1.96	1.24	0.01	0.10	0.07	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.28	1.96	1.24	0.01	0.44	0.07	3.3
Total	0.58	5.75	3.19	0.02	11.35	1.22	6.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Total	0.29	3.77	1.90	0.01	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	2	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed
^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.10	0.52	1.12	0.00	0.06	0.04
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.28	1.96	1.24	0.01	0.10	0.07
Total	0.28	1.98	1.29	0.01	0.10	0.07

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	1.1	0.0	1.1
Worker Commute	2.1	0.0	2.1
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	2.145	0.214	5.36	0.54
Water Truck	1	Unpaved	2.5	2.145	0.214	5.36	0.54
Onsite Total						10.72	1.07
Offsite							
Concrete Truck	2	Paved	60	0.001	0.000	0.10	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						11.06	1.07

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		44.0	9.15	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

Table 52
Operational Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT/yr)
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00	8
Motor Vehicle Exhaust	0.08	0.64	0.05	0.00	0.02	0.01	2
Motor Vehicle Fugitive PM	--	--	--	--	5.20	0.51	--
SF6 Leakage	--	--	--	--	--	--	660
Total	0.17	1.22	0.62	0.01	5.24	0.52	670

Emergency Diesel Generator Usage

Equipment	Horse-power	Number	Days Used/Year	Hours Used/Day
Emergency Diesel Generator	440	1	52	1

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Emergency Diesel Generator	440	0.086	0.582	0.570	0.003	0.017	0.000	336.853	0.008	Generator Sets

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Emergency Diesel Generator Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00
Total	0.09	0.58	0.57	0.00	0.02	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Emergency Diesel Generator Annual Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Emergency Diesel Generator	7.9	0.0	7.9
Total	7.9	0.0	7.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used/Year	Miles/Day/Veh.
Transmission Line Inspection	1	1	65
Subtransmission Line Inspection	1	1	62
Substation Site Visit	1	48	60

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Transmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Subtransmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Substation Site Visit	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Transmission Line Inspection	0.03	0.22	0.02	0.00	0.01	0.00
Subtransmission Line Inspection	0.03	0.21	0.02	0.00	0.01	0.00
Substation Site Visit	0.03	0.21	0.02	0.00	0.01	0.00
Total	0.08	0.64	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Annual Greenhouse Gas Emissions

Vehicle	CO2 (MT/yr) ^a	CH4 (MT/yr) ^a	CO2e (MT/yr) ^b
Transmission Line Inspection	0.0	0.0	0.0
Subtransmission Line Inspection	0.0	0.0	0.0
Substation Site Visit	1.5	0.0	1.5
Total	1.5	0.0	1.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 52
Operational Emissions

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Transmission Line Inspection	1	Paved	60	0.001	0.000	0.05	0.00
Transmission Line Inspection	1	Unpaved	5	1.012	0.101	5.06	0.51
Subtransmission Line Inspection	1	Paved	62	0.001	0.000	0.05	0.00
Substation Site Visit	1	Paved	60	0.001	0.000	0.05	0.00
Total						5.20	0.51

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

SF6 Leakage Greenhouse Gas Emissions

Item	Value	Units
SF6 in 500 kV Equipment	11,515	pounds
SF6 in 115 kV Equipment	1,257	pounds
Total SF6 Added	12,772	pounds
SF6 Leakage Rate	0.5	%/year
SF6 Emissions	63.86	pounds
SF6 Global Warming Potential ^a	22,800	
CO2e Emissions^b	660	MT/yr

^a Based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0,

April 2008.

http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

^b CO₂e emissions [metric tons] = SF₆ emissions [lb] x

Global warming potential [lb CO₂e/lb SF₆] x 453.6 [g/lb] /

1,000,000 [g/MT]

Substation	Item	SF6 Volume (Pounds Each)	Quantity Added	Total SF6 Volume (Pounds)
500 kV				
Alberhill	Circuit Breaker	1,645	7	11,515
500 kV Total				11,515
115 kV				
Alberhill	Circuit Breaker	83	15	1,245
Valley	Circuit Breaker	71	(1)	(71)
Newcomb	Circuit Breaker	83	1	83
115 kV Total				1,257
Total Change				12,772

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin	SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	Aerial Lifts	Aerial Lifts0000	0.0101	0.0528	0.0831	0.0001	0.0025	8.7	0.0009
	25	Aerial Lifts	Aerial Lifts0016	0.0132	0.0451	0.0838	0.0001	0.0032	11.0	0.0012
	50	Aerial Lifts	Aerial Lifts0026	0.0168	0.1351	0.1218	0.0003	0.0035	19.6	0.0015
	120	Aerial Lifts	Aerial Lifts0051	0.0176	0.2265	0.1496	0.0004	0.0063	38.1	0.0016
	500	Aerial Lifts	Aerial Lifts0121	0.0580	0.3710	0.3660	0.0021	0.0109	213	0.0052
	750	Aerial Lifts	Aerial Lifts0501	0.1054	0.6706	0.6753	0.0039	0.0199	385	0.0095
Aerial Lifts Composite		Aerial Lifts	Aerial Lifts0751	0.0184	0.1646	0.1366	0.0004	0.0048	34.7	0.0017
Air Compressors	15	Air Compressors	Air Compressors0000	0.0087	0.0444	0.0545	0.0001	0.0023	7.2	0.0008
	25	Air Compressors	Air Compressors0016	0.0181	0.0605	0.1121	0.0002	0.0045	14.4	0.0016
	50	Air Compressors	Air Compressors0026	0.0263	0.1911	0.1476	0.0003	0.0047	22.3	0.0024
	120	Air Compressors	Air Compressors0051	0.0289	0.3023	0.1928	0.0006	0.0088	47.0	0.0026
	175	Air Compressors	Air Compressors0121	0.0424	0.4998	0.2187	0.0010	0.0104	88.5	0.0038
	250	Air Compressors	Air Compressors0176	0.0514	0.2531	0.2553	0.0015	0.0078	131	0.0046
	500	Air Compressors	Air Compressors0251	0.0894	0.4292	0.4150	0.0023	0.0134	232	0.0081
	750	Air Compressors	Air Compressors0501	0.1385	0.6633	0.6545	0.0036	0.0210	358	0.0125
	1000	Air Compressors	Air Compressors0751	0.1999	0.9265	2.5439	0.0049	0.0483	486	0.0180
	Air Compressors Composite		Air Compressors	Air Compressors1001	0.0349	0.3027	0.2104	0.0007	0.0088	63.6
Bore/Drill Rigs	15	Bore/Drill Rigs	Bore/Drill Rigs0000	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	25	Bore/Drill Rigs	Bore/Drill Rigs0016	0.0193	0.0658	0.1219	0.0002	0.0046	16.0	0.0017
	50	Bore/Drill Rigs	Bore/Drill Rigs0026	0.0190	0.2200	0.1662	0.0004	0.0009	31.0	0.0017
	120	Bore/Drill Rigs	Bore/Drill Rigs0051	0.0252	0.4660	0.1955	0.0009	0.0020	77.1	0.0023
	175	Bore/Drill Rigs	Bore/Drill Rigs0121	0.0324	0.7542	0.0787	0.0016	0.0030	141	0.0029
	250	Bore/Drill Rigs	Bore/Drill Rigs0176	0.0427	0.3426	0.0981	0.0021	0.0035	188	0.0039
	500	Bore/Drill Rigs	Bore/Drill Rigs0251	0.0706	0.5512	0.1622	0.0031	0.0058	311	0.0064
	750	Bore/Drill Rigs	Bore/Drill Rigs0501	0.1396	1.0891	0.3204	0.0062	0.0115	615	0.0126
	1000	Bore/Drill Rigs	Bore/Drill Rigs0751	0.2115	1.6437	3.8912	0.0093	0.0364	928	0.0191
Bore/Drill Rigs Composite		Bore/Drill Rigs	Bore/Drill Rigs1001	0.0428	0.5007	0.2864	0.0017	0.0042	165	0.0039
Cement and Mortar Mixers	15	Cement and Mortar Mixers	Cement and Mortar Mixers0000	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	Cement and Mortar Mixers	Cement and Mortar Mixers0016	0.0213	0.0724	0.1346	0.0002	0.0052	17.6	0.0019
Cement and Mortar Mixers Composite		Cement and Mortar Mixers	Cement and Mortar Mixers0026	0.0085	0.0414	0.0534	0.0001	0.0021	7.2	0.0008
Concrete/Industrial Saws	25	Concrete/Industrial Saws	Concrete/Industrial Saws0000	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018
	50	Concrete/Industrial Saws	Concrete/Industrial Saws0026	0.0279	0.2284	0.1910	0.0004	0.0053	30.2	0.0025
	120	Concrete/Industrial Saws	Concrete/Industrial Saws0051	0.0370	0.4561	0.2840	0.0009	0.0117	74.1	0.0033
	175	Concrete/Industrial Saws	Concrete/Industrial Saws0121	0.0623	0.8663	0.3523	0.0018	0.0160	160	0.0056
Concrete/Industrial Saws Composite		Concrete/Industrial Saws	Concrete/Industrial Saws0176	0.0337	0.3706	0.2471	0.0007	0.0093	58.5	0.0030
Cranes	50	Cranes	Cranes0000	0.0350	0.2256	0.1644	0.0003	0.0062	23.2	0.0032
	120	Cranes	Cranes0051	0.0376	0.3384	0.2298	0.0006	0.0120	50.1	0.0034
	175	Cranes	Cranes0121	0.0462	0.4744	0.2300	0.0009	0.0120	80.3	0.0042
	250	Cranes	Cranes0176	0.0544	0.2316	0.2705	0.0013	0.0094	112	0.0049
	500	Cranes	Cranes0251	0.0858	0.3535	0.3977	0.0018	0.0146	180	0.0077
	750	Cranes	Cranes0501	0.1446	0.5947	0.6821	0.0030	0.0248	303	0.0130
	9999	Cranes	Cranes0751	0.5219	1.9715	5.5760	0.0098	0.1146	971	0.0471
Cranes Composite		Cranes	Cranes1000	0.0681	0.3738	0.4223	0.0014	0.0143	129	0.0061
Crawler Tractors	50	Crawler Tractors	Crawler Tractors0000	0.0487	0.2566	0.1842	0.0003	0.0090	24.9	0.0044
	120	Crawler Tractors	Crawler Tractors0051	0.0609	0.4537	0.3562	0.0008	0.0221	65.8	0.0055
	175	Crawler Tractors	Crawler Tractors0121	0.0823	0.7265	0.4447	0.0014	0.0241	121	0.0074
	250	Crawler Tractors	Crawler Tractors0176	0.0924	0.3662	0.5348	0.0019	0.0192	166	0.0083
	500	Crawler Tractors	Crawler Tractors0251	0.1392	0.5877	0.7527	0.0025	0.0280	259	0.0126
	750	Crawler Tractors	Crawler Tractors0501	0.2506	1.0528	1.3878	0.0047	0.0510	465	0.0226
	1000	Crawler Tractors	Crawler Tractors0751	0.3749	1.5618	4.2168	0.0066	0.0656	658	0.0338
Crawler Tractors Composite		Crawler Tractors	Crawler Tractors1001	0.0789	0.5065	0.4482	0.0013	0.0227	114	0.0071

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin		SC								
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Crushing/Proc. Equipment	50	Crushing/Proc. Equipment	Crushing/Proc. Equipment000	0.0508	0.3859	0.2899	0.0006	0.0083	44.0	0.0046
	120	Crushing/Proc. Equipment	Crushing/Proc. Equipment0051	0.0506	0.5406	0.3289	0.0010	0.0140	83.1	0.0046
	175	Crushing/Proc. Equipment	Crushing/Proc. Equipment0121	0.0795	0.9556	0.3830	0.0019	0.0177	167	0.0072
	250	Crushing/Proc. Equipment	Crushing/Proc. Equipment0176	0.0967	0.4768	0.4357	0.0028	0.0134	245	0.0087
	500	Crushing/Proc. Equipment	Crushing/Proc. Equipment0251	0.1459	0.6977	0.6163	0.0037	0.0200	374	0.0132
	750	Crushing/Proc. Equipment	Crushing/Proc. Equipment0501	0.2307	1.1003	0.9907	0.0059	0.0316	589	0.0208
9999	Crushing/Proc. Equipment	Crushing/Proc. Equipment0751	0.6019	2.5014	6.6977	0.0131	0.1238	1,308	0.0543	
Crushing/Proc. Equipment Composite		Crushing/Proc. Equipment	Crushing/Proc. Equipment10000	0.0693	0.6187	0.3763	0.0015	0.0146	132	0.0062
Dumpers/Tenders	25	Dumpers/Tenders	Dumpers/Tenders0000	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Dumpers/Tenders Composite		Dumpers/Tenders	Dumpers/Tenders0026	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Excavators	25	Excavators	Excavators0000	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018
	50	Excavators	Excavators0026	0.0297	0.2365	0.1616	0.0003	0.0035	25.0	0.0027
	120	Excavators	Excavators0051	0.0448	0.4942	0.2638	0.0009	0.0092	73.6	0.0040
	175	Excavators	Excavators0121	0.0518	0.6636	0.1982	0.0013	0.0091	112	0.0047
	250	Excavators	Excavators0176	0.0647	0.3210	0.2222	0.0018	0.0074	159	0.0058
	500	Excavators	Excavators0251	0.0946	0.4495	0.3091	0.0023	0.0107	234	0.0085
750	Excavators	Excavators0501	0.1569	0.7451	0.5194	0.0039	0.0178	387	0.0142	
Excavators Composite		Excavators	Excavators0056	0.0559	0.5086	0.2269	0.0013	0.0086	120	0.0050
Forklifts	50	Forklifts	Forklifts0000	0.0150	0.1361	0.0904	0.0002	0.0013	14.7	0.0014
	120	Forklifts	Forklifts0051	0.0168	0.2086	0.0997	0.0004	0.0023	31.2	0.0015
	175	Forklifts	Forklifts0121	0.0228	0.3310	0.0732	0.0006	0.0029	56.1	0.0021
	250	Forklifts	Forklifts0176	0.0289	0.1551	0.0746	0.0009	0.0027	77.1	0.0026
	500	Forklifts	Forklifts0251	0.0416	0.2123	0.1038	0.0011	0.0038	111	0.0038
Forklifts Composite		Forklifts	Forklifts0501	0.0236	0.2148	0.0860	0.0006	0.0025	54.4	0.0021
Generator Sets	15	Generator Sets	Generator Sets0000	0.0109	0.0627	0.0768	0.0002	0.0032	10.2	0.0010
	25	Generator Sets	Generator Sets0016	0.0216	0.0738	0.1368	0.0002	0.0055	17.6	0.0019
	50	Generator Sets	Generator Sets0026	0.0242	0.2034	0.1881	0.0004	0.0051	30.6	0.0022
	120	Generator Sets	Generator Sets0051	0.0340	0.4585	0.3022	0.0009	0.0122	77.9	0.0031
	175	Generator Sets	Generator Sets0121	0.0469	0.7328	0.3291	0.0016	0.0136	142	0.0042
	250	Generator Sets	Generator Sets0176	0.0558	0.3746	0.3885	0.0024	0.0108	213	0.0050
	500	Generator Sets	Generator Sets0251	0.0862	0.5820	0.5697	0.0033	0.0167	337	0.0078
	750	Generator Sets	Generator Sets0501	0.1401	0.9395	0.9382	0.0055	0.0272	544	0.0126
	9999	Generator Sets	Generator Sets0751	0.3235	1.8648	5.2188	0.0105	0.0888	1,049	0.0292
Generator Sets Composite		Generator Sets	Generator Sets10000	0.0288	0.2667	0.2329	0.0007	0.0081	61.0	0.0026
Graders	50	Graders	Graders0000	0.0382	0.2599	0.1877	0.0004	0.0063	27.5	0.0034
	120	Graders	Graders0051	0.0521	0.5009	0.3219	0.0009	0.0153	75.0	0.0047
	175	Graders	Graders0121	0.0652	0.7261	0.3117	0.0014	0.0157	124	0.0059
	250	Graders	Graders0176	0.0781	0.3549	0.3652	0.0019	0.0129	172	0.0071
	500	Graders	Graders0251	0.1023	0.4610	0.4468	0.0023	0.0165	229	0.0092
	750	Graders	Graders0501	0.2167	0.9755	0.9628	0.0049	0.0353	486	0.0196
Graders Composite		Graders	Graders0751	0.0676	0.5696	0.3314	0.0015	0.0147	133	0.0061
Off-Highway Tractors	120	Off-Highway Tractors	Off-Highway Tractors0000	0.1108	0.6619	0.6362	0.0011	0.0455	93.7	0.0100
	175	Off-Highway Tractors	Off-Highway Tractors0121	0.1110	0.7932	0.6639	0.0015	0.0370	130	0.0100
	250	Off-Highway Tractors	Off-Highway Tractors0176	0.0890	0.3179	0.5983	0.0015	0.0227	130	0.0090
	750	Off-Highway Tractors	Off-Highway Tractors0251	0.3692	1.5358	2.4157	0.0057	0.0918	568	0.0333
	1000	Off-Highway Tractors	Off-Highway Tractors0751	0.5623	2.3619	6.0896	0.0082	0.1577	814	0.0507
Off-Highway Tractors Composite		Off-Highway Tractors	Off-Highway Tractors1001	0.1134	0.6101	0.7291	0.0017	0.0331	151	0.0102
Off-Highway Trucks	175	Off-Highway Trucks	Off-Highway Trucks0000	0.0622	0.7536	0.2376	0.0014	0.0112	125	0.0056
	250	Off-Highway Trucks	Off-Highway Trucks0176	0.0730	0.3435	0.2521	0.0019	0.0085	167	0.0066
	500	Off-Highway Trucks	Off-Highway Trucks0251	0.1183	0.5319	0.3878	0.0027	0.0135	272	0.0107
	750	Off-Highway Trucks	Off-Highway Trucks0501	0.1921	0.8627	0.6384	0.0044	0.0221	442	0.0173
	1000	Off-Highway Trucks	Off-Highway Trucks0751	0.2823	1.2403	3.1782	0.0063	0.0546	625	0.0255
Off-Highway Trucks Composite		Off-Highway Trucks	Off-Highway Trucks1001	0.1140	0.5385	0.4769	0.0027	0.0142	260	0.0103

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025				(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Air Basin	SC			COG	CO	NOX	SOX	PM	CO2	CH4
Equipment	MaxHP									
Other Construction Equipment	15	Other Construction Equipment	Other Construction Equipment000	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
	25	Other Construction Equipment	Other Construction Equipment0016	0.0159	0.0544	0.1008	0.0002	0.0038	13.2	0.0014
	50	Other Construction Equipment	Other Construction Equipment0026	0.0244	0.2188	0.1893	0.0004	0.0034	28.0	0.0022
	120	Other Construction Equipment	Other Construction Equipment0051	0.0379	0.5045	0.2730	0.0009	0.0087	80.9	0.0034
	175	Other Construction Equipment	Other Construction Equipment0121	0.0384	0.5858	0.1729	0.0012	0.0075	107	0.0035
500	Other Construction Equipment	Other Construction Equipment0176	0.0792	0.4606	0.3034	0.0025	0.0099	254	0.0071	
Other Construction Equipment Composite		Other Construction Equipment	Other Construction Equipment0501	0.0442	0.3474	0.2021	0.0013	0.0069	123	0.0040
Other General Industrial Equipmen	15	Other General Industrial Equipmen	Other General Industrial Equipmen0000	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
	25	Other General Industrial Equipmen	Other General Industrial Equipmen0016	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017
	50	Other General Industrial Equipmen	Other General Industrial Equipmen0026	0.0298	0.2099	0.1491	0.0003	0.0047	21.7	0.0027
	120	Other General Industrial Equipmen	Other General Industrial Equipmen0051	0.0436	0.4189	0.2803	0.0007	0.0120	62.0	0.0039
	175	Other General Industrial Equipmen	Other General Industrial Equipmen0121	0.0519	0.5684	0.2412	0.0011	0.0115	95.9	0.0047
	250	Other General Industrial Equipmen	Other General Industrial Equipmen0176	0.0608	0.2743	0.2679	0.0015	0.0083	136	0.0055
	500	Other General Industrial Equipmen	Other General Industrial Equipmen0251	0.1174	0.5103	0.4826	0.0026	0.0157	265	0.0106
	750	Other General Industrial Equipmen	Other General Industrial Equipmen0501	0.1939	0.8411	0.8117	0.0044	0.0262	437	0.0175
	1000	Other General Industrial Equipmen	Other General Industrial Equipmen0751	0.2627	1.1060	2.9924	0.0056	0.0579	560	0.0237
	Other General Industrial Equipmen Composite		Other General Industrial Equipmen	Other General Industrial Equipmen1001	0.0747	0.4438	0.3947	0.0016	0.0130	152
Other Material Handling Equipment	50	Other Material Handling Equipment	Other Material Handling Equipment0000	0.0410	0.2893	0.2073	0.0004	0.0065	30.3	0.0037
	120	Other Material Handling Equipment	Other Material Handling Equipment0051	0.0421	0.4076	0.2541	0.0007	0.0117	60.7	0.0038
	175	Other Material Handling Equipment	Other Material Handling Equipment0121	0.0653	0.7197	0.3067	0.0014	0.0146	122	0.0059
	250	Other Material Handling Equipment	Other Material Handling Equipment0176	0.0642	0.2920	0.2863	0.0016	0.0088	145	0.0058
	500	Other Material Handling Equipment	Other Material Handling Equipment0251	0.0837	0.3670	0.3482	0.0019	0.0113	192	0.0075
9999	Other Material Handling Equipment	Other Material Handling Equipment0501	0.3781	1.4596	3.9555	0.0073	0.0764	741	0.0341	
Other Material Handling Equipment Composite		Other Material Handling Equipment	Other Material Handling Equipment1000	0.0696	0.4355	0.3844	0.0015	0.0124	141	0.0063
Pavers	25	Pavers	Pavers0000	0.0225	0.0768	0.1422	0.0002	0.0053	18.7	0.0020
	50	Pavers	Pavers0026	0.0574	0.2803	0.2102	0.0004	0.0114	28.0	0.0052
	120	Pavers	Pavers0051	0.0662	0.4696	0.4003	0.0008	0.0263	68.2	0.0060
	175	Pavers	Pavers0121	0.0899	0.7543	0.5238	0.0014	0.0286	128	0.0081
	250	Pavers	Pavers0176	0.1097	0.4287	0.7020	0.0022	0.0254	194	0.0099
500	Pavers	Pavers0251	0.1263	0.5374	0.7572	0.0023	0.0284	233	0.0114	
Pavers Composite		Pavers	Pavers0501	0.0717	0.4745	0.3858	0.0009	0.0220	77.9	0.0065
Paving Equipment	25	Paving Equipment	Paving Equipment0000	0.0152	0.0520	0.0963	0.0002	0.0036	12.6	0.0014
	50	Paving Equipment	Paving Equipment0026	0.0468	0.2355	0.1789	0.0003	0.0095	23.9	0.0042
	120	Paving Equipment	Paving Equipment0051	0.0503	0.3671	0.3092	0.0006	0.0200	54.5	0.0045
	175	Paving Equipment	Paving Equipment0121	0.0687	0.5900	0.4021	0.0011	0.0219	101	0.0062
250	Paving Equipment	Paving Equipment0176	0.0672	0.2648	0.4289	0.0014	0.0154	122	0.0061	
Paving Equipment Composite		Paving Equipment	Paving Equipment0251	0.0548	0.3993	0.3281	0.0008	0.0190	68.9	0.0049
Plate Compactors	15	Plate Compactors	Plate Compactors0000	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Plate Compactors Composite		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Pressure Washers	15	Pressure Washers	Pressure Washers0000	0.0052	0.0301	0.0368	0.0001	0.0015	4.9	0.0005
	25	Pressure Washers	Pressure Washers0016	0.0087	0.0299	0.0555	0.0001	0.0022	7.1	0.0008
	50	Pressure Washers	Pressure Washers0026	0.0079	0.0810	0.0843	0.0002	0.0019	14.3	0.0007
	120	Pressure Washers	Pressure Washers0051	0.0082	0.1351	0.0897	0.0003	0.0031	24.1	0.0007
Pressure Washers Composite		Pressure Washers	Pressure Washers0121	0.0066	0.0531	0.0561	0.0001	0.0019	9.4	0.0006
Pumps	15	Pumps	Pumps0000	0.0089	0.0456	0.0560	0.0001	0.0024	7.4	0.0008
	25	Pumps	Pumps0016	0.0244	0.0816	0.1512	0.0002	0.0061	19.5	0.0022
	50	Pumps	Pumps0026	0.0299	0.2394	0.2138	0.0004	0.0061	34.3	0.0027
	120	Pumps	Pumps0051	0.0365	0.4656	0.3062	0.0009	0.0129	77.9	0.0033
	175	Pumps	Pumps0121	0.0499	0.7342	0.3301	0.0016	0.0142	140	0.0045
	250	Pumps	Pumps0176	0.0572	0.3604	0.3745	0.0023	0.0107	201	0.0052
	500	Pumps	Pumps0251	0.0959	0.6034	0.5922	0.0034	0.0178	345	0.0087
	750	Pumps	Pumps0501	0.1593	0.9975	0.9991	0.0057	0.0297	571	0.0144
	9999	Pumps	Pumps0751	0.4488	2.4388	6.8114	0.0136	0.1186	1,355	0.0405

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025											
Air Basin		SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
				COG	CO	NOX	SOX	PM	CO2	CH4	
Pumps Composite		Pumps	Pumps10000	0.0270	0.2617	0.2079	0.0006	0.0078	49.6	0.0024	
Rollers	15	Rollers	Rollers0000	0.0074	0.386	0.0461	0.0001	0.0018	6.3	0.0007	
	25	Rollers	Rollers0016	0.0161	0.0549	0.1017	0.0002	0.0038	13.3	0.0015	
	50	Rollers	Rollers0026	0.0345	0.2258	0.1776	0.0003	0.0068	26.0	0.0031	
	120	Rollers	Rollers0051	0.0392	0.3801	0.2847	0.0007	0.0137	59.0	0.0035	
	175	Rollers	Rollers0121	0.0553	0.6096	0.3030	0.0012	0.0156	108	0.0050	
	250	Rollers	Rollers0176	0.0656	0.3037	0.3629	0.0017	0.0127	153	0.0059	
Rollers Composite	500	Rollers	Rollers0251	0.0920	0.4189	0.4752	0.0022	0.0174	219	0.0083	
		Rollers	Rollers0501	0.0410	0.3763	0.2501	0.0008	0.0122	67.0	0.0037	
Rough Terrain Forklifts	50	Rough Terrain Forklifts	Rough Terrain Forklifts0000	0.0381	0.3041	0.2193	0.0004	0.0054	33.9	0.0034	
	120	Rough Terrain Forklifts	Rough Terrain Forklifts0051	0.0369	0.4106	0.2316	0.0007	0.0087	62.4	0.0033	
	175	Rough Terrain Forklifts	Rough Terrain Forklifts0121	0.0569	0.7229	0.2450	0.0014	0.0112	125	0.0051	
	250	Rough Terrain Forklifts	Rough Terrain Forklifts0176	0.0671	0.3372	0.2625	0.0019	0.0084	171	0.0061	
	Rough Terrain Forklifts Composite	500	Rough Terrain Forklifts	Rough Terrain Forklifts0251	0.0999	0.4838	0.3682	0.0025	0.0123	257	0.0090
			Rough Terrain Forklifts	Rough Terrain Forklifts0501	0.0396	0.4430	0.2336	0.0008	0.0090	70.3	0.0036
Rubber Tired Dozers	175	Rubber Tired Dozers	Rubber Tired Dozers0000	0.1163	0.8019	0.6895	0.0015	0.0386	129	0.0105	
	250	Rubber Tired Dozers	Rubber Tired Dozers0176	0.1329	0.4624	0.8841	0.0021	0.0340	183	0.0120	
	500	Rubber Tired Dozers	Rubber Tired Dozers0251	0.1817	0.7490	1.1543	0.0026	0.0448	265	0.0164	
	750	Rubber Tired Dozers	Rubber Tired Dozers0501	0.2747	1.1262	1.7818	0.0040	0.0684	399	0.0248	
	Rubber Tired Dozers Composite	1000	Rubber Tired Dozers	Rubber Tired Dozers0751	0.4321	1.7954	4.5523	0.0060	0.1202	592	0.0390
			Rubber Tired Dozers	Rubber Tired Dozers1001	0.1672	0.6620	1.0824	0.0025	0.0419	239	0.0151
Rubber Tired Loaders	25	Rubber Tired Loaders	Rubber Tired Loaders0000	0.0204	0.0697	0.1291	0.0002	0.0048	16.9	0.0018	
	50	Rubber Tired Loaders	Rubber Tired Loaders0026	0.0418	0.2904	0.2109	0.0004	0.0069	31.1	0.0038	
	120	Rubber Tired Loaders	Rubber Tired Loaders0051	0.0397	0.3916	0.2476	0.0007	0.0115	58.9	0.0036	
	175	Rubber Tired Loaders	Rubber Tired Loaders0121	0.0546	0.6199	0.2592	0.0012	0.0130	106	0.0049	
	250	Rubber Tired Loaders	Rubber Tired Loaders0176	0.0661	0.3041	0.3040	0.0017	0.0107	149	0.0060	
	500	Rubber Tired Loaders	Rubber Tired Loaders0251	0.1034	0.4654	0.4455	0.0023	0.0164	237	0.0093	
	750	Rubber Tired Loaders	Rubber Tired Loaders0501	0.2119	0.9532	0.9273	0.0049	0.0338	486	0.0191	
	Rubber Tired Loaders Composite	1000	Rubber Tired Loaders	Rubber Tired Loaders0751	0.2701	1.1927	3.2272	0.0060	0.0615	594	0.0244
			Rubber Tired Loaders	Rubber Tired Loaders1001	0.0559	0.4311	0.2835	0.0012	0.0121	109	0.0050
	Scrapers	120	Scrapers	Scrapers0000	0.0887	0.6472	0.5218	0.0011	0.0330	93.9	0.0080
175		Scrapers	Scrapers0121	0.1025	0.8864	0.5654	0.0017	0.0307	148	0.0092	
250		Scrapers	Scrapers0176	0.1187	0.4642	0.7040	0.0024	0.0254	209	0.0107	
500		Scrapers	Scrapers0251	0.1755	0.7332	0.9727	0.0032	0.0364	321	0.0158	
Scrapers Composite		750	Scrapers	Scrapers0501	0.3043	1.2657	1.7266	0.0056	0.0638	555	0.0275
			Scrapers	Scrapers0751	0.1495	0.7187	0.8387	0.0027	0.0335	262	0.0135
Signal Boards	15	Signal Boards	Signal Boards0000	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006	
	50	Signal Boards	Signal Boards0016	0.0332	0.2686	0.2268	0.0005	0.0063	36.2	0.0030	
	120	Signal Boards	Signal Boards0051	0.0394	0.4898	0.3076	0.0009	0.0127	80.2	0.0036	
	175	Signal Boards	Signal Boards0121	0.0587	0.8292	0.3433	0.0017	0.0152	155	0.0053	
	250	Signal Boards	Signal Boards0176	0.0794	0.4676	0.4435	0.0029	0.0132	255	0.0072	
Signal Boards Composite		Signal Boards	Signal Boards0251	0.0111	0.9909	0.0718	0.0002	0.0029	16.7	0.0010	
Skid Steer Loaders	25	Skid Steer Loaders	Skid Steer Loaders0000	0.0167	0.0568	0.1055	0.0002	0.0040	13.8	0.0015	
	50	Skid Steer Loaders	Skid Steer Loaders0026	0.0194	0.1977	0.1446	0.0003	0.0015	25.5	0.0017	
	120	Skid Steer Loaders	Skid Steer Loaders0051	0.0175	0.2665	0.1240	0.0005	0.0022	42.8	0.0016	
Skid Steer Loaders Composite		Skid Steer Loaders	Skid Steer Loaders0121	0.0186	0.2104	0.1354	0.0004	0.0019	30.3	0.0017	
Surfacing Equipment	50	Surfacing Equipment	Surfacing Equipment0000	0.0171	0.1105	0.0934	0.0002	0.0035	14.1	0.0015	
	120	Surfacing Equipment	Surfacing Equipment0051	0.0385	0.3950	0.2869	0.0007	0.0146	63.8	0.0035	
	175	Surfacing Equipment	Surfacing Equipment0121	0.0386	0.4642	0.2429	0.0010	0.0119	85.8	0.0035	
	250	Surfacing Equipment	Surfacing Equipment0176	0.0504	0.2804	0.3275	0.0015	0.0111	135	0.0045	
	500	Surfacing Equipment	Surfacing Equipment0251	0.0800	0.4236	0.4893	0.0022	0.0174	221	0.0072	
	750	Surfacing Equipment	Surfacing Equipment0501	0.1260	0.6643	0.7833	0.0035	0.0275	347	0.0114	
Surfacing Equipment Composite		Surfacing Equipment	Surfacing Equipment0751	0.0638	0.3590	0.3924	0.0017	0.0142	166	0.0058	

Table 53
SCAB Fleet Average Emission Factors (Diesel)

		2025								
Air Basin		SC								
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOx	SOx	PM	CO2	CH4
Sweepers/Scrubbers	15	Sweepers/Scrubbers	Sweepers/Scrubbers000	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011
	25	Sweepers/Scrubbers	Sweepers/Scrubbers0016	0.0237	0.0808	0.1495	0.0002	0.0056	19.6	0.0021
	50	Sweepers/Scrubbers	Sweepers/Scrubbers0026	0.0308	0.2762	0.1942	0.0004	0.0033	31.6	0.0028
	120	Sweepers/Scrubbers	Sweepers/Scrubbers0051	0.0395	0.4895	0.2530	0.0009	0.0068	75.0	0.0036
	175	Sweepers/Scrubbers	Sweepers/Scrubbers0121	0.0565	0.8005	0.2201	0.0016	0.0084	139	0.0051
	250	Sweepers/Scrubbers	Sweepers/Scrubbers0176	0.0587	0.3179	0.1898	0.0018	0.0062	162	0.0053
Sweepers/Scrubbers Composite			Sweepers/Scrubbers0251	0.0410	0.4840	0.2255	0.0009	0.0061	78.5	0.0037
Tractors/Loaders/Backhoes	25	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0000	0.0191	0.0653	0.1209	0.0002	0.0045	15.9	0.0017
	50	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0026	0.0316	0.2678	0.1895	0.0004	0.0037	30.3	0.0029
	120	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0051	0.0281	0.3379	0.1761	0.0006	0.0055	51.7	0.0025
	175	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0121	0.0420	0.5839	0.1613	0.0011	0.0072	101	0.0038
	250	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0176	0.0633	0.3389	0.2157	0.0019	0.0073	172	0.0057
	500	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0251	0.1263	0.6506	0.4127	0.0039	0.0144	345	0.0114
	750	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0501	0.1896	0.9760	0.6256	0.0058	0.0216	517	0.0171
Tractors/Loaders/Backhoes Composite			Tractors/Loaders/Backhoes0751	0.0336	0.3586	0.1857	0.0008	0.0059	66.8	0.0030
Trenchers	15	Trenchers	Trenchers0000	0.0099	0.0517	0.0617	0.0001	0.0024	8.5	0.0009
	25	Trenchers	Trenchers0016	0.0397	0.1355	0.2509	0.0004	0.0094	32.9	0.0036
	50	Trenchers	Trenchers0026	0.0687	0.3197	0.2467	0.0004	0.0140	32.9	0.0062
	120	Trenchers	Trenchers0051	0.0625	0.4341	0.3863	0.0008	0.0259	64.9	0.0056
	175	Trenchers	Trenchers0121	0.1009	0.8327	0.6152	0.0016	0.0338	144	0.0091
	250	Trenchers	Trenchers0176	0.1247	0.4925	0.8480	0.0025	0.0309	223	0.0112
	500	Trenchers	Trenchers0251	0.1661	0.7370	1.0663	0.0031	0.0400	311	0.0150
	750	Trenchers	Trenchers0501	0.3147	1.3882	2.0666	0.0059	0.0766	587	0.0284
Trenchers Composite			Trenchers0751	0.0674	0.4085	0.3481	0.0007	0.0215	58.7	0.0061
Welders	15	Welders	Welders0000	0.0075	0.0381	0.0468	0.0001	0.0020	6.2	0.0007
	25	Welders	Welders0016	0.0141	0.0473	0.0876	0.0001	0.0035	11.3	0.0013
	50	Welders	Welders0026	0.0280	0.2077	0.1684	0.0003	0.0053	26.0	0.0025
	120	Welders	Welders0051	0.0223	0.2476	0.1601	0.0005	0.0073	39.5	0.0020
	175	Welders	Welders0121	0.0430	0.5400	0.2396	0.0011	0.0111	98.2	0.0039
	250	Welders	Welders0176	0.0423	0.2236	0.2294	0.0013	0.0069	119	0.0038
	500	Welders	Welders0251	0.0585	0.3040	0.2969	0.0016	0.0095	168	0.0053
Welders Composite				0.0214	0.1745	0.1373	0.0003	0.0052	25.6	0.0019

Source: File off-road-mobile-source-emission-factors-scenario-years-2007-2025).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>

Table 54
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories: **Passenger Vehicles & Delivery Trucks.**

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: 2025			
All model years in the range 1981 to 2025			
Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00342738	CO	0.00595363
NOx	0.00028846	NOx	0.00615945
ROG	0.00043545	ROG	0.00092178
SOx	0.00001070	SOx	0.00002761
PM10	0.00009679	PM10	0.00028425
PM2.5	0.00006418	PM2.5	0.00020958
CO2	1.11078571	CO2	2.88143570
CH4	0.00003641	CH4	0.00003765

Source: File on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/>

Table 55
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: 2025			
All model years in the range 1981 to 2025			
HHDT-DSL (pounds/mile)	HHDT-DSL, Exh (pounds/mile)		
CO	0.00431086	PM10	0.00034397
NOx	0.00932573	PM2.5	0.00031664
ROG	0.00080206		
SOx	0.00004018		
PM10	0.00048541		
PM2.5	0.00036326		
CO2	4.19512979		
CH4	0.00003697		

Source: File heavy-heavy-duty-on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from [http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-\(v2-3\)-emission-factors-\(on-road\)](http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-(v2-3)-emission-factors-(on-road))

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
1/2-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1/2-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
1-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
10-cu. yd. Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
10-cu. yd. Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
1-Ton Crew Cab Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
1-Ton Crew Cab, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
1-Ton Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
3/4-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
3/4-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
40' Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
40' Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Asphalt Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Asphalt Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Carry-all Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Carry-all Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Concrete Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Crew Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
Crew Vehicle	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Vehicle	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
Crewcab Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crewcab Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	0%	1.24E+00	1.24E-01
Crushed Rock Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crushed Rock Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Dump Truck (Trash)	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck (Trash)	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Extendable Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Extendable Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Flat Bed Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flat Bed Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Flatbed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flatbed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Fuel, Helicopter Support Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Fuel, Helicopter Support Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Jet A Fuel Truck	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Jet A Fuel Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Low Bed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Low Bed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Lowboy Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Lowboy Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Maintenance Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
Maintenance Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	0%	1.69E+00	1.69E-01
Pipe Truck/Trailer	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Pipe Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Reel Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Reel Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	0%	1.69E+00	1.69E-01
Stake Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stake Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Stakebed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stakebed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Truck, Semi Tractor	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Truck, Semi Tractor	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Van	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Van	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Water Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Water Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Wire Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Wire Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	0%	2.14E+00	2.14E-01
Worker Commute	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Worker Commute	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	0%	1.01E+00	1.01E-01

^a Paved road silt loading from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997) for collector roads, <http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf>

Unpaved road silt content from SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden

^b Average paved on-road vehicle weight in Riverside County from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

Unpaved worker commuting weight on access road assumed to be same as paved road weight

Unpaved weight for other trucks is based on upper limit of 33,000 lbs for medium heavy-duty trucks.

^c Equations:

EF(paved) = $k_p (sL/2)^{0.65} (W/3)^{1.5} - C$

Ref: AP-42, Section 13.2.1, "Paved Rods," November 2006

EF (unpaved) = $k_u (s/12)^a (W/3)^b$

Ref: AP-42, Section 13.2.2, "Unpaved Rods," November 2006

Constants:

k_p =	0.016	(Particle size multiplier for PM10)
	0.0024	(Particle size multiplier for PM2.5)
C =	0.00047	(Exhaust, brake wear and tire wear adjustment, PM10)
	0.00036	(Exhaust, brake wear and tire wear adjustment, PM2.5)
k_u =	1.5	(Particle size multiplier for PM)
	0.15	(Particle size multiplier for PM2.5)
a =	0.9	for PM10
	0.9	for PM2.5
b =	0.45	for PM10
	0.45	for PM2.5

^d Control efficiency from watering unpaved roads twice per day, from Table XI-D, Mitigation Measure Examples, Fugitive Dust from Unpaved Roads, http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html

^e Controlled emission factor [lb/mi] = Uncontrolled emission factor [lb/mi] x (1 - Control efficiency [%] / 100)

Table 57
Fugitive Dust Emission Factors
Soil Dropping During Excavation

Emission Factor [lb/cu. yd] = 0.0011 x (mean wind speed [mi/hr] / 5)^{1.3} / (moisture [%] / 2)^{1.4} x (number drops per ton) x (density [ton/cu. yd])
 Reference: AP-42, Equation (1), Section 13.2.4, November 2006

Parameter	Value	Basis
Mean Wind Speed	12	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G, default
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil
Number Drops	4	Assumption
Soil Density	1.215	Table 2.46, Handbook of Solid Waste Management

PM10 Emission Factor (Uncontrolled) 9.94E-04 lb/cu. yd
 Reduction from Watering Twice/Day^b 0%
 Controlled PM10 Emission Factor 9.94E-04 lb/cu. yd
 Controlled PM2.5 Emission Factor^a 2.07E-04 lb/cu. yd

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per cubic yard] x Volume soil handled [cubic yards per day]

Table 57
Fugitive Dust Emission Factors
Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
 Reference: SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-E

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Pct. time wind > 12 mph	100	Worst-case assumption

PM10 Emission Factor (Uncontrolled) 44.0 lb/day-acre
 Reduction from Watering Twice/Day 0%
 Controlled PM10 Emission Factor 44.0 lb/day-acre
 Controlled PM2.5 Emission Factor^a 9.2 lb/day-acre

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per acre-day] x Storage pile surface area [acres]

Table 57
Fugitive Dust Emission Factors
Bulldozing, Scraping and Grading

Emission Factor [lb/hr] = 0.75 x (silt content [%])^{1.5} / (moisture)^{1.4}
 Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil

PM10 Emission Factor (Uncontrolled) 0.348 lb/hr
 Reduction from Watering Twice/Day 0%
 Controlled PM10 Emission Factor 0.348 lb/hr
 Controlled PM2.5 Emission Factor^a 0.072 lb/hr

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing, scraping or grading time [hours/day]

SOIL IMPORT OPTION 2 WITH PROJECT COMMITMENT J

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Construction Emissions

The following emissions were calculated for construction activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:
 - a. Daily emissions were calculated for each construction phase for each Proposed Project Component.

These calculations are in Table 7 through Table 50.

Total daily emissions, including both on-site and off-site sources, are summarized by construction phase in Table 1.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

PM10 and PM2.5 emission factors for earth moving and soil handling were calculated from AP-42 sections and from the SCAQMD CEQA Handbook.

These emission factors are in Table 57.
 - b. The construction phases for each Proposed Project component that could overlap were identified, and daily emissions from overlapping phases were added together. The highest emissions that could occur on a single day during construction of each Proposed Project component were then identified. These emissions are summarized in Table 2.
 - c. Since construction of all of the Proposed Project components could occur at the same time, the maximum daily emissions during construction of the components were added together to estimate peak daily construction emissions. However, since substation site demolition and water line relocation activities would be completed prior to the start of any other construction, they were not included in the peak daily emissions calculation. The peak daily construction emissions are in Table 2.
2. Maximum daily on-site emissions during construction of each Proposed Project component for use in a Localized Significance Threshold (LST) analysis using the look-up table in Appendix C to the SCAQMD's Localized Significance Methodology. The following steps were used to calculate these emissions and to conduct the LST analysis.
 - a. Daily on-site emissions were calculated for each construction phase for each Proposed Project Component. On-site emissions for substation construction were defined as emissions that would occur on the substation site. On-site emissions for 500 kV transmission line and 115 kV subtransmission line construction were defined as emissions that would occur at a single 500 kV lattice tower or a 115 kV pole

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location.

These calculations are in Table 9 through Table 50.

On-site daily emissions by construction phase are summarized in Table 3.

The same emission factors used to calculate total daily emission were used to calculate on-site daily emissions.

- b. Since multiple construction phases could occur at the same time at the substation site, daily on-site emissions from overlapping phases were added together to identify maximum on-site daily emissions during substation construction. Maximum daily on-site emissions during telecommunications construction were added to the maximum daily emissions during substation construction, since telecommunications construction will occur at the substation site. Maximum daily on-site emissions Table 4.
- c. Since only one construction phase could occur at a 500 kV transmission line tower location or 115 kV subtransmission line pole location, emissions from overlapping phases were not added together to calculate maximum daily on-site emissions. Maximum daily on-site emissions during 500 kV transmission line and 115 kV subtransmission line construction are in Table 4.
- d. Distances to the closest receptors were determined for the LST analysis. For the substation site, the distance to the closest commercial receptor was used for analyses for CO and NO₂, since the air quality thresholds are for short-term averaging periods. The distance to the closest residential receptor was used for the PM₁₀ and PM_{2.5} analyses, since the air quality thresholds are for 24-hour averaging periods, and an individual would probably not be located at a commercial location for 24 hours.
The closest receptor to a 500 kV transmission tower location is a residence.
A distance of 25 meters was assumed for the receptor distance for the analysis for 115 kV subtransmission line construction.
- e. The look-up table values for the Lake Elsinore source/receptor area were used for the LST analyses.
- f. The maximum construction area in the look-up tables of 5 acres was used for the LST analysis for the substation site, and the minimum area of 1 acre was used for the 500 kV transmission line tower and 115 kV subtransmission line pole analyses.
- g. The maximum allowable daily on-site emissions for the analyses for the substation and 500 kV transmission line towers were calculated using linear interpolation with receptor distance of the emissions in the look-up tables to calculate allowable emissions for the actual receptor distances. Interpolation was not used for the LST analyses for the 115 kV subtransmission line analyses, since the receptor distance was assumed to be 25 meters. The LST analyses are in Table 5.

3. Total greenhouse gas (GHG) emissions during construction. The following steps were used to calculate these emissions:

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- a. Total GHG emissions were calculated for each construction phase for Each Proposed Project Component. These calculations are in Table 9 through Table 50. Total GHG emissions, including both on-site and off-site sources, are summarized by construction phase in Table 6.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

- b. Total GHG emissions during each construction phase were added together to calculate total GHG emissions during construction. These emissions are summarized in Table 6.

Operational Emissions

The following emissions were calculated for operational activities:

1. Peak daily criteria pollutant emissions for comparison with the South Coast Air Quality Management District (SCAQMD) mass daily emissions CEQA significance thresholds. The following steps were used to calculate these emissions:

- a. Daily emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

The exhaust emission factors are in Table 53 through Table 55.

Emission factors for fugitive PM10 and PM2.5 from vehicle travel on paved and unpaved roads were calculated using emission factor equations from AP-42 Sections 13.2.1 and 13.2.2.

These emission factors are in Table 56.

- b. It was conservatively assumed that the transmission line inspections would both occur on the same day as a visit to the substation site, and daily emissions from these three activities were added together to peak daily operational emissions. These emissions are in Table 52.

2. Annual greenhouse gas (GHG) emissions during operation. The following steps were used to calculate these emissions:

- a. Annual emissions were calculated for each operational activity, including 500 kV transmission line inspections, 115 kV subtransmission line inspections and visits to the substation site. These calculations are in Table 52.

Emission factors for off-road construction equipment and motor vehicle exhaust are from the SCAQMD CEQA Handbook webpage for calendar year 2025.

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The exhaust emission factors are in Table 53 through Table 55.

- b. Annual emissions from leakage of sulfur hexafluoride (SF6) from gas-insulated switch gear (GIS) were calculated by multiplying the total amount of SF6 in new GIS by the estimated annual leakage rate. The annual SF6 leakage rate was then multiplied by the SF6 global warming potential to calculate annual CO2-equivalent emissions from SF6 leakage. These calculations are in Table 52.
- c. Annual GHG emissions from the operational activities and from SF6 leakage were added together to calculate Annual operational GHG emissions. These emissions are summarized in Table 52.

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	3.42	23.90	30.16	0.12	13.35	2.22
Substation Site Water Line Relocation	0.65	6.60	2.80	0.01	18.26	1.92
Substation Construction						
Survey	0.11	0.86	0.07	0.00	5.78	0.57
Grading	6.44	42.22	49.09	0.20	90.04	12.44
Fencing	0.42	4.32	1.30	0.01	16.15	1.62
Civil	2.90	31.01	20.07	0.10	23.43	2.88
Control Building	0.17	1.32	0.20	0.00	14.80	1.47
Electrical	1.26	12.43	6.41	0.03	17.75	1.96
Wiring	0.28	2.25	0.63	0.01	11.58	1.16
Transformers	0.66	6.27	2.25	0.01	21.41	2.20
Maintenance Crew Equipment Check	0.12	0.94	0.19	0.00	15.42	1.54
Testing	0.11	0.87	0.07	0.00	8.56	0.85
Asphalting	2.41	11.86	12.23	0.05	24.21	2.77
Landscaping	1.72	11.07	15.40	0.07	20.80	2.43
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	9.32	0.93
Marshalling Yard	0.63	4.65	2.81	0.02	14.43	1.51
Roads and Landing Work	2.37	19.00	10.34	0.05	30.22	4.38
Install Helicopter Platforms	0.16	1.23	0.10	0.00	0.32	0.02
Tower Removal	1.02	6.57	4.56	0.02	47.74	4.91
Foundation Removal	0.61	6.89	2.73	0.01	22.42	2.33
Tower Foundations Installation	2.01	15.93	6.66	0.06	48.92	5.11
Install Micropile Foundations	0.16	1.23	0.10	0.00	0.32	0.02
Tower Steel Haul	0.31	3.62	0.90	0.01	25.12	2.53
Tower Steel Assembly	0.98	8.03	3.96	0.02	15.36	1.64
Tower Erection	1.46	8.84	6.22	0.03	38.06	3.98
Tower Erection (Helicopter) Ground Support	0.82	6.98	2.35	0.02	42.96	4.34
Tower Helicopter Operations	46.71	56.80	577.42	32.18	12.02	12.02
Wire Stringing	20.27	61.08	38.52	1.51	175.06	18.50
Restoration	1.08	8.31	4.75	0.03	23.20	2.75
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard	0.36	3.35	1.16	0.01	10.65	1.09
Roads and Landing Work	1.79	14.07	8.05	0.04	5.22	1.19
Guard Structure Installation	1.61	10.08	7.33	0.05	0.69	0.27
Remove Existing Wood H-Frames and Poles	1.07	7.58	4.97	0.02	0.60	0.20
Remove Existing Tubular Steel/Light Weight Steel Poles	0.98	5.99	4.23	0.02	0.69	0.18
Install Tubular Steel Pole Foundations	1.41	11.32	5.50	0.05	1.65	0.33
Steel Pole Haul	0.70	3.43	3.10	0.02	0.41	0.12
Steel Pole Assembly	0.98	5.99	4.23	0.02	0.69	0.18
Steel Pole Erection	0.98	5.99	4.23	0.02	0.69	0.18
Wire Stringing	5.07	29.37	24.43	0.15	2.08	0.80
Vault Installation	2.63	17.58	10.62	0.07	2.05	0.52
Duct Bank Installation	1.39	13.75	6.11	0.04	2.20	0.46
Install Underground Cable	3.51	19.09	13.63	0.09	1.50	0.50
Guard Structure Removal	1.50	9.66	7.71	0.04	0.69	0.29
Restoration	1.22	9.85	5.55	0.03	3.58	0.53
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation	0.27	2.81	1.45	0.01	0.30	0.07
Control Building	0.54	3.56	3.15	0.02	0.23	0.09
Overhead Communications Installation	0.60	3.97	3.18	0.02	0.33	0.10
Substation Telecommunications Equipment Installation	0.08	0.62	0.05	0.00	0.16	0.01
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	16.20	1.65
Additional Substation Construction						

Table 1
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	1.16	12.41	6.30	0.03	5.48	0.73
Electrical	1.41	13.32	7.68	0.03	0.84	0.31
Wiring	0.44	3.97	1.56	0.01	0.59	0.09
Testing	0.11	0.83	0.07	0.00	0.22	0.02
Civil - Demo	0.58	5.75	3.19	0.02	5.46	0.63

Table 2
Construction Emissions Summary
Total Daily Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Construction						
Survey	0.11	0.86	0.07	0.00	5.78	0.57
Grading	6.44	42.22	49.09	0.20	90.04	12.44
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	5.43	40.28	23.30	0.12	129.89	13.56
Civil	2.90	31.01	20.07	0.10	23.43	2.88
Landscaping	1.72	11.07	15.40	0.07	20.80	2.43
Maximum	6.44	42.22	49.09	0.20	129.89	13.56
500 kV Transmission Line Construction						
Survey	0.11	0.89	0.08	0.00	9.32	0.93
Marshalling Yard, Road and Landing Work, Install Helicopter Platforms	3.15	24.89	13.25	0.07	44.97	5.91
Marshalling Yard, Tower Removal, Tower Foundations Installation, Install Micropile Foundations, Tower Steel Haul, Tower Steel Assembly, Tower Erection, Tower Erection (Helicopter) Ground Support, Tower Helicopter Operations	54.09	112.65	604.98	32.37	244.93	36.06
Marshalling Yard, Foundation Removal	1.24	11.55	5.54	0.03	36.85	3.84
Marshalling Yard, Wire Stringing	20.89	65.73	41.33	1.52	189.48	20.01
Restoration	1.08	8.31	4.75	0.03	23.20	2.75
Maximum	54.09	112.65	604.98	32.37	244.93	36.06
115 kV Subtransmission Line Construction						
Survey	0.12	0.96	0.08	0.00	0.25	0.02
Marshalling Yard, Roads and Landing Work, Guard Structure Installation, Remove Existing Wood H-Frames and Poles, Remove Existing Tubular Steel/Light Weight Steel Poles, Install Tubular Steel Pole Foundations, Steel Pole Haul, Steel Pole Assembly, Steel Pole Erection, Wire Stringing, Guard Structure Removal, Vault Installation, Duct Bank Installation, Install Underground Cable	23.99	157.27	105.30	0.64	29.82	6.30
Restoration	1.22	9.85	5.55	0.03	3.58	0.53
Maximum	23.99	157.27	105.30	0.64	29.82	6.30
Telecommunications Construction						
Tower Foundation	0.71	8.05	4.31	0.02	0.93	0.25
Tower Construction	0.99	5.82	4.82	0.02	0.45	0.18
Dish Installation, Control Building, Overhead Communications Installation, Substation Telecommunications Equipment Installation	1.49	10.96	7.83	0.05	1.02	0.28
Santiago Peak Communication Site	0.45	2.87	1.50	0.01	16.20	1.65
Maximum	1.49	10.96	7.83	0.05	16.20	1.65
Additional Substation Construction						
Civil, Electrical, Wiring, Testing, Civil - Demo	3.68	36.28	18.80	0.09	12.58	1.77
Maximum	3.68	36.28	18.80	0.09	12.58	1.77
PEAK DAILY^b	89.69	359.37	786.00	33.35	433.42	59.34

^a The construction phases within a group could all occur at the same time.

^b Peak daily emissions are the sum of the maximum daily emissions during construction of the substation, the 500 kV transmission lines, the 115 kV subtransmission lines, the telecommunications facilities, and additional substation construction.

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	10.05	1.33
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	17.89	1.89
Substation Construction						
Survey	0.00	0.03	0.00	0.00	5.57	0.56
Grading	3.72	26.92	20.27	0.07	85.55	11.28
Fencing	0.16	2.27	1.13	0.00	15.61	1.58
Civil	1.69	23.53	10.30	0.04	22.13	2.45
Control Building	0.01	0.09	0.09	0.00	14.48	1.45
Electrical	0.87	9.35	6.16	0.02	16.94	1.90
Wiring	0.08	0.61	0.49	0.00	11.14	1.13
Transformers	0.40	4.21	2.08	0.01	20.87	2.16
Maintenance Crew Equipment Check	0.02	0.12	0.12	0.00	15.21	1.52
Testing	0.01	0.05	0.00	0.00	8.35	0.84
Asphalting	1.52	6.44	4.79	0.01	22.67	2.44
Landscaping	0.30	2.81	1.80	0.00	18.41	1.87
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	14.08	1.47
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	10.43	1.08
Roads and Landing Work	1.60	12.73	7.50	0.04	4.88	1.15
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	1.16	0.25
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	0.71	0.36
Duct Bank Installation	0.71	8.86	3.54	0.02	0.89	0.30
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	3.10	0.48
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	15.98	1.64
Additional Substation Construction						

Table 3
Construction Emissions Summary
Onsite Daily Criteria Pollutant Emissions by Construction Phase

Phase	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	4.99	0.61
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	5.02	0.56

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group ^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Substation Site Demolition	1.39	12.73	7.70	0.02	10.05	1.33
Substation Site Water Line Relocation	0.47	5.16	2.68	0.01	17.89	1.89
Substation and Telecommunications Construction						
Survey	0.00	0.03	0.00	0.00	5.57	0.56
Grading	3.72	26.92	20.27	0.07	85.55	11.28
Fencing, Control Building, Electrical, Wiring, Transformers, Maintenance Crew Equipment Check, Testing, Asphaltting	3.05	23.14	14.86	0.04	125.28	13.02
Civil	1.69	23.53	10.30	0.04	22.13	2.45
Landscaping	0.30	2.81	1.80	0.00	18.41	1.87
Maximum Substation Construction	3.72	26.92	20.27	0.07	125.28	13.02
Maxim Substation plus Telecommunications	4.55	33.66	24.65	0.09	141.26	14.66
500 kV Transmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.43	3.24	1.93	0.01	14.08	1.47
Roads and Landing Work	2.09	16.82	9.96	0.05	9.63	2.33
Install Helicopter Platforms	1.15	15.80	7.68	0.03	1.62	0.51
Tower Removal	0.75	4.54	3.93	0.02	0.16	0.15
Foundation Removal	0.48	5.92	2.51	0.01	0.11	0.10
Tower Foundations Installation	1.73	13.83	6.02	0.05	0.43	0.26
Install Micropile Foundations	1.15	15.80	7.68	0.03	0.24	0.22
Tower Steel Haul	0.18	2.65	0.59	0.01	0.02	0.02
Tower Steel Assembly	0.70	5.79	3.60	0.02	0.14	0.13
Tower Erection	1.07	5.93	5.55	0.02	0.21	0.20
Tower Erection (Helicopter) Ground Support	0.00	0.00	0.00	0.00	0.00	0.00
Tower Helicopter Operations	0.00	0.00	0.00	0.00	0.00	0.00
Wire Stringing	5.93	32.28	29.00	0.15	1.00	0.92
Restoration	0.87	6.75	4.42	0.02	2.77	0.71
Maximum	5.93	32.28	29.00	0.15	14.08	2.33
115 kV Subtransmission Line Construction						
Survey	0.00	0.00	0.00	0.00	0.00	0.00
Marshalling Yard	0.26	2.53	1.09	0.01	10.43	1.08
Roads and Landing Work	1.60	12.73	7.50	0.04	4.88	1.15
Guard Structure Installation	1.35	8.18	6.39	0.04	0.23	0.22
Remove Existing Wood H-Frames and Poles	0.84	5.86	4.22	0.02	0.17	0.16
Remove Existing Tubular Steel/Light Weight Steel Poles	0.66	3.63	3.35	0.01	0.13	0.12
Install Tubular Steel Pole Foundations	1.11	9.18	4.07	0.03	1.16	0.25
Steel Pole Haul	0.51	2.12	2.39	0.01	0.09	0.08
Steel Pole Assembly	0.66	3.63	3.35	0.01	0.13	0.12
Steel Pole Erection	0.66	3.63	3.35	0.01	0.13	0.12
Wire Stringing	4.34	23.98	22.32	0.13	0.72	0.66
Vault Installation	1.92	12.58	7.81	0.05	0.71	0.36
Duct Bank Installation	0.71	8.86	3.54	0.02	0.89	0.30
Install Underground Cable	2.99	15.06	12.75	0.08	0.44	0.40
Guard Structure Removal	1.27	7.94	6.96	0.03	0.27	0.25
Restoration	0.96	7.93	4.78	0.02	3.10	0.48
Maximum	4.34	23.98	22.32	0.13	10.43	1.15
Telecommunications Construction						
Tower Foundation	0.53	6.74	3.59	0.01	0.61	0.21
Tower Construction	0.83	4.64	4.38	0.02	0.17	0.15
Dish Installation	0.14	1.81	1.20	0.00	0.05	0.05
Control Building	0.46	2.97	2.93	0.02	0.09	0.08
Overhead Communications Installation	0.46	2.97	2.93	0.02	0.09	0.08
Substation Telecommunications Equipment Installation	0.00	0.00	0.00	0.00	0.00	0.00
Santiago Peak Communication Site	0.35	2.05	1.43	0.01	15.98	1.64
Maximum	0.83	6.74	4.38	0.02	15.98	1.64
Additional Substation Construction						

Table 4
Construction Emissions Summary
Total Daily Onsite Criteria Pollutant Emissions for Overlapping Construction Phases

Group^a	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Civil	0.78	9.93	3.94	0.02	4.99	0.61
Electrical	1.15	11.27	7.51	0.02	0.30	0.27
Wiring	0.17	1.92	1.39	0.00	0.06	0.05
Testing	0.00	0.00	0.00	0.00	0.00	0.00
Civil - Demo	0.30	3.79	1.95	0.01	5.02	0.56
Maximum	1.15	11.27	7.51	0.02	5.02	0.61

^a The construction phases within a group could all occur at the same time at the same location.

The following 115 kV Subtransmission Line construction activity emissions were divided by the following number of locations:

- Roads and Landing Work: 6 structure pads per day
- Guard Structure Installation: 4 structures per day
- Remove Existing H-Frames and Poles: 15 poles per day
- Remove Existing Tubular Steel/Light Weight Steel Poles: 2 poles per day
- Steel Pole Assembly: 2 poles per day
- Steel Pole Erection: 2 poles per day
- Guard Structure Removal: 6 structures per day
- Restoration: 6 structure pads per day

Table 5
Construction Emissions
Localized Significance Threshold Analysis

Pollutant	Maximum Daily Onsite Emissions	Receptor Distance (m)	Allowable Emissions Interpolation ^a				Interpolated Emissions (lb/day) ^b	Allowable Exceeded?
			Distance 1 (m)	Emissions 1 (lb/day)	Distance 2 (m)	Emissions 2 (lb/day)		
Demolition^{c,d}								
CO	13	270	200	7,535	500	25,792	11,795	No
NOx	8	270	200	672	500	1,072	765	No
PM10	10	420	200	96	500	207	177	No
PM2.5	1	420	200	31	500	105	85	No
Water Line Relocation^{c,e}								
CO	5	270	200	4,850	500	21,040	8,628	No
NOx	3	270	200	460	500	896	562	No
PM10	18	420	200	67	500	178	148	No
PM2.5	2	420	200	20	500	86	68	No
Substation and Telecommunications Construction^c								
CO	34	270	200	7,535	500	25,792	11,795	No
NOx	25	270	200	672	500	1,072	765	No
PM10	141	420	200	96	500	207	177	No
PM2.5	15	420	200	31	500	105	85	No
500 kV Transmission Line Construction^f								
CO	32	93	50	974	100	1,918	1,786	No
NOx	29	93	50	203	100	292	280	No
PM10	14	93	50	12	100	30	27	No
PM2.5	2	93	50	4	100	8	7	No
115 kV Subtransmission Line Construction^g								
CO	24	25	25	661	25	661	661	No
NOx	22	25	25	162	25	162	162	No
PM10	10	25	25	13	25	13	13	No
PM2.5	1	25	25	3	25	3	3	No

^a Allowable emissions are from Appendix C to Final Localized Significance Methodology, SCAQMD, revised July 2008, downloaded from <http://www.aqmd.gov/ceqa/handbook/LST/LST.html>

^b Interpolated emissions = Emissions 1 + (Receptor distance - Distance 1) x (Emissions 2 - Emissions 1) / (Distance 2 - Distance 1)

^c CO and NOx receptor distances are closest commercial receptor; PM10 and PM2.5 are closest residential receptor. Allowable emissions are for a 5 acre site.

^d Allowable emissions are for a 5 acre site.

^e Allowable emissions are for a 1 acre site.

^f Closest receptor to a transmission tower base is a residence at approximately 93 meters. Allowable emissions are for a 1 acre site.

^g Allowable emissions for CO, NOx and PM2.5 are for a 1-acre site to represent construction at a pole location.

Maximum PM10 emissions occur at the marshalling yard, so allowable emissions are for a 5-acre site

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO ₂ e (MT)
Substation Site Demolition	283.31
Substation Site Water Line Relocation	11.84
Substation Construction	
Survey	1.89
Grading	561.85
Fencing	7.31
Civil	375.00
Control Building	4.02
Electrical	346.90
Wiring	71.94
Transformers	57.20
Maintenance Crew Equipment Check	8.83
Testing	25.71
Asphalting	66.81
Landscaping	144.94
500 kV Transmission Line Construction	
Survey	0.52
Marshalling Yard	87.79
Roads and Landing Work	53.15
Install Helicopter Platforms	32.89
Tower Removal	4.03
Foundation Removal	1.46
Tower Foundations Installation	63.63
Install Micropile Foundations	122.15
Tower Steel Haul	3.76
Tower Steel Assembly	38.82
Tower Erection	32.96
Tower Erection (Helicopter) Ground Support	6.40
Tower Helicopter Operations	1,626.43
Wire Stringing	18.53
Restoration	4.27
115 kV Subtransmission Line Construction	
Survey	2.54
Marshalling Yard	145.31
Roads and Landing Work	128.76
Guard Structure Installation	52.96
Remove Existing Wood H-Frames and Poles	24.84
Remove Existing Tubular Steel/Light Weight Steel Poles	4.98
Install Tubular Steel Pole Foundations	159.88
Steel Pole Haul	95.64
Steel Pole Assembly	254.01
Steel Pole Erection	254.01
Wire Stringing	541.72
Vault Installation	15.31
Duct Bank Installation	17.61
Install Underground Cable	94.21
Guard Structure Removal	29.04
Restoration	22.66
Telecommunications Construction	
Tower Foundation	3.69

Table 6
Construction Emissions Summary
Total Greenhouse Gas Emissions by Construction Phase

Phase	CO₂e (MT)
Tower Construction	29.76
Dish Installation	2.99
Control Building	21.81
Overhead Communications Installation	28.92
Substation Telecommunications Equipment Installation	0.91
Santiago Peak Communication Site	18.85
Additional Substation Construction	
Civil	11.89
Electrical	24.70
Wiring	12.80
Testing	2.43
Civil - Demo	6.67
Total	6,073.23

Table 7
Substation Site Demolition Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.39	12.69	7.61	0.02	0.39	0.36	47.9
Onsite Motor Vehicle Exhaust	0.01	0.04	0.09	0.00	0.00	0.00	1.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	9.65	0.97	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.39	12.73	7.70	0.02	10.05	1.33	48.9
Offsite Motor Vehicle Exhaust	2.03	11.17	22.45	0.10	1.19	0.89	234.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	2.11	0.00	
Offsite Total	2.03	11.17	22.45	0.10	3.30	0.89	234.4
Total	3.42	23.90	30.16	0.12	13.35	2.22	283.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Track Loader	148	2	50	8
Bobcat	75	1	50	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Track Loader	148	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Track Loader	1.32	11.62	7.11	0.02	0.39	0.35
Bobcat	0.07	1.07	0.50	0.00	0.01	0.01
Total	1.39	12.69	7.61	0.02	0.39	0.36

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Track Loader	44.0	0.0	44.0
Bobcat	3.9	0.0	3.9
Total	47.9	0.0	47.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	1	50	4	10
Offsite				
Dump Truck	40	50	N/A	60
Worker Commute	4	50	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 20,000 CY hauled offsite over 50 days and 10 CY/truck = 20,000 / 50 / 10 = 40

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 7
Substation Site Demolition Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.01	0.04	0.09	0.00	0.00	0.00
Offsite						
Dump Truck	1.92	10.35	22.38	0.10	1.16	0.87
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	2.03	11.17	22.45	0.10	1.19	0.89
Total	2.04	11.21	22.54	0.10	1.19	0.89

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	1.0	0.0	1.0
Onsite Total	1.0	0.0	1.0
Offsite			
Dump Truck	228.3	0.0	228.4
Worker Commute	6.0	0.0	6.1
Offsite Total	234.4	0.0	234.4
Total	235.3	0.0	235.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Onsite Total						9.65	0.97
Offsite							
Dump Truck	40	Paved	60	0.001	0.000	1.92	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						2.11	0.00
Total						11.77	0.97

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion ^d	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 8
Substation Site Water Line Relocation Emissions**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	5.08	2.56	0.01	0.10	0.10	7.4
Onsite Motor Vehicle Exhaust	0.01	0.09	0.12	0.00	0.01	0.01	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	17.63	1.76	
Earthwork Fugitive PM	--	--	--	--	0.15	0.03	
Onsite Total	0.47	5.16	2.68	0.01	17.89	1.89	7.6
Offsite Motor Vehicle Exhaust	0.18	1.44	0.12	0.00	0.04	0.03	4.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.18	1.44	0.12	0.00	0.38	0.03	4.2
Total	0.65	6.60	2.80	0.01	18.26	1.92	11.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	20	8
Crane	125	1	20	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.46	5.08	2.56	0.01	0.10	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	3.8	0.0	3.8
Crane	3.6	0.0	3.6
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	20	1	2.5
Stakebed Truck	2	20	2	5
Crew Vehicle	2	20	2	5
Offsite				
Worker Commute	7	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Stakebed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Highest (Most Conservative) EMFAC2007 (version 2.3) or Highest (Most Conservative) EMFAC2007 (version 2.3)

Table 8
Substation Site Water Line Relocation Emissions

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.00	0.01	0.02	0.00	0.00	0.00
Stakebed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.12	0.00	0.01	0.01
Offsite						
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.18	1.44	0.12	0.00	0.04	0.03
Total	0.20	1.53	0.24	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.2	0.0	0.2
Offsite			
Worker Commute	4.2	0.0	4.2
Offsite Total	4.2	0.0	4.2
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Stakebed Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Crew Vehicle	2	Unpaved	5	0.556	0.056	5.56	0.56
Onsite Total						17.63	1.76
Offsite							
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						17.97	1.76

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	147	9.94E-04	2.07E-04	0.15	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.15	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Based on trench 4 ft. wide x 6 ft. deep x 1,700 ft. long over 20 days x 2 = 4 ft. x 6 ft. x 1,770 ft. / 27 cu. ft. per CY / 20 days = 151 CY/day 7

**Table 9
Substation Construction Emissions
Survey**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.03	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	5.56	0.56	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.03	0.00	0.00	5.57	0.56	0.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	1.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	1.8
Total	0.11	0.86	0.07	0.00	5.78	0.57	1.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Vehicle	2	15	2	5
Offsite				
Worker Commute	4	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 9
Substation Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Vehicle	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.03	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.86	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Vehicle	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	1.8	0.0	1.8
Offsite Total	1.8	0.0	1.8
Total	1.9	0.0	1.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Vehicle	2	Unpaved	5	0.556	0.056	5.56	0.56
Onsite Total						5.56	0.56
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						5.76	0.56

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 10
Substation Construction Emissions
Grading

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	3.67	26.54	20.08	0.07	0.79	0.73	188.2
Onsite Motor Vehicle Exhaust	0.05	0.38	0.19	0.00	0.02	0.01	4.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	65.58	6.56	
Earthwork Fugitive PM	--	--	--	--	19.16	3.99	
Onsite Total	3.72	26.92	20.27	0.07	85.55	11.28	192.9
Offsite Motor Vehicle Exhaust	2.73	15.30	28.82	0.13	1.55	1.15	369.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	2.94	0.00	
Offsite Total	2.73	15.30	28.82	0.13	4.49	1.15	369.0
Total	6.44	42.22	49.09	0.20	90.04	12.44	561.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Dozer	305	1	60	7
Loader	147	2	60	4
Scraper	267	1	60	7
Grader	110	1	60	7
4x4 Backhoe	79	2	60	7
4x4 Tamper	174	1	60	7

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Dozer	305	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Loader	147	0.055	0.620	0.259	0.001	0.013	0.012	106.315	0.005	Rubber Tired Loaders
Scraper	267	0.176	0.733	0.973	0.003	0.036	0.034	321.428	0.016	Scrapers
Grader	110	0.052	0.501	0.322	0.001	0.015	0.014	74.965	0.005	Graders
4x4 Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
4x4 Tamper	174	0.038	0.586	0.173	0.001	0.007	0.007	106.516	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Dozer	0.97	4.11	5.27	0.02	0.20	0.18
Loader	0.44	4.96	2.07	0.01	0.10	0.10
Scraper	1.23	5.13	6.81	0.02	0.26	0.23
Grader	0.36	3.51	2.25	0.01	0.11	0.10
4x4 Backhoe	0.39	4.73	2.47	0.01	0.08	0.07
4x4 Tamper	0.27	4.10	1.21	0.01	0.05	0.05
Total	3.67	26.54	20.08	0.07	0.79	0.73

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Dozer	49.4	0.0	49.4
Loader	23.1	0.0	23.2
Scraper	61.2	0.0	61.3
Grader	14.3	0.0	14.3
4x4 Backhoe	19.7	0.0	19.7
4x4 Tamper	20.3	0.0	20.3
Total	188.1	0.0	188.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 10
Substation Construction Emissions
Grading

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Water Truck	1	60	7	17.5
Crew Vehicle	5	60	7	17.5
Offsite				
Dump Truck	96	60	N/A	32
Worker Commute	10	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Vehicle	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.01	0.08	0.16	0.00	0.01	0.01
Crew Vehicle	0.04	0.30	0.03	0.00	0.01	0.01
Onsite Total	0.05	0.38	0.19	0.00	0.02	0.01
Offsite						
Dump Truck	2.46	13.24	28.65	0.12	1.49	1.12
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	2.73	15.30	28.82	0.13	1.55	1.15
Total	2.78	15.67	29.01	0.13	1.57	1.17

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	2.0	0.0	2.0
Crew Vehicle	2.6	0.0	2.6
Onsite Total	4.6	0.0	4.6
Offsite			
Dump Truck	350.7	0.0	350.8
Worker Commute	18.1	0.0	18.2
Offsite Total	368.9	0.0	369.0
Total	373.5	0.0	373.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	17.5	0.965	0.097	16.89	1.69
Crew Vehicle	5	Unpaved	17.5	0.556	0.056	48.69	4.87
Onsite Total						65.58	6.56
Offsite							
Dump Truck	96	Paved	32	0.001	0.000	2.46	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						2.94	0.00
Total						68.52	6.56

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 10
Substation Construction Emissions
Grading

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	3,078	9.94E-04	2.07E-04	3.06	0.64
Bulldozing, Scraping and Grading	hr/day	21	0.348	0.072	7.30	1.52
Storage Pile Wind Erosion ^d	acres	0.4	22.0	4.58	8.80	1.83
Total					19.16	3.99

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 184,700 CY over 60 days

^d Based on 1,000 CY in each of two cones 9 ft. tall x 100 ft. diameter

**Table 11
Substation Construction Emissions
Fencing**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	2.13	0.99	0.00	0.02	0.02	2.3
Onsite Motor Vehicle Exhaust	0.02	0.13	0.14	0.00	0.01	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	15.59	1.56	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.16	2.27	1.13	0.00	15.61	1.58	2.8
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	4.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	4.5
Total	0.42	4.32	1.30	0.01	16.15	1.62	7.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bobcat	75	1	15	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bobcat	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bobcat	0.14	2.13	0.99	0.00	0.02	0.02
Total	0.14	2.13	0.99	0.00	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bobcat	2.3	0.0	2.3
Total	2.3	0.0	2.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Flatbed Truck	1	15	3	7.5
Crewcab Truck	3	15	2	5
Offsite				
Worker Commute	10	15	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Flatbed Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Crewcab Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

**Table 11
Substation Construction Emissions
Fencing**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Flatbed Truck	0.01	0.04	0.05	0.00	0.00	0.00
Crewcab Truck	0.01	0.09	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.13	0.14	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.19	0.31	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Flatbed Truck	0.1	0.0	0.1
Crewcab Truck	0.3	0.0	0.3
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	4.5	0.0	4.5
Offsite Total	4.5	0.0	4.5
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Flatbed Truck	1	Unpaved	7.5	0.965	0.097	7.24	0.72
Crewcab Truck	3	Unpaved	5	0.556	0.056	8.35	0.83
Onsite Total						15.59	1.56
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						16.07	1.56

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 12
Substation Construction Emissions
Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.68	23.43	10.09	0.04	0.26	0.24	155.6
Onsite Motor Vehicle Exhaust	0.02	0.10	0.21	0.00	0.01	0.01	3.9
Onsite Motor Vehicle Fugitive PM	--	--	--	--	21.72	2.17	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	1.69	23.53	10.30	0.04	22.13	2.45	159.4
Offsite Motor Vehicle Exhaust	1.21	7.48	9.77	0.05	0.58	0.43	215.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	1.21	7.48	9.77	0.05	1.30	0.43	215.6
Total	2.90	31.01	20.07	0.10	23.43	2.88	375.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	152	2	90	4
Foundation Auger	79	2	90	7
Backhoe	79	3	90	6
Skip Loader	75	2	90	3
Bobcat Skid Steer	75	2	90	4
Forklift	83	1	90	4
17-Ton Crane	125	1	90	2

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Foundation Auger	79	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Skip Loader	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts
17-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.41	5.31	1.59	0.01	0.07	0.07
Foundation Auger	0.35	6.52	2.74	0.01	0.03	0.03
Backhoe	0.51	6.08	3.17	0.01	0.10	0.09
Skip Loader	0.10	1.60	0.74	0.00	0.01	0.01
Bobcat Skid Steer	0.14	2.13	0.99	0.00	0.02	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
17-Ton Crane	0.09	0.95	0.46	0.00	0.02	0.02
Total	1.68	23.43	10.09	0.04	0.26	0.24

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	36.7	0.0	36.7
Foundation Auger	44.1	0.0	44.1
Backhoe	38.0	0.0	38.1
Skip Loader	10.5	0.0	10.5
Bobcat Skid Steer	26.2	0.0	26.3
Forklift	0.0	0.0	0.0
17-Ton Crane	0.0	0.0	0.0
Total	155.5	0.0	155.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 12
Substation Construction Emissions
Civil

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	90	2	5
Water Truck	1	90	5	12.5
Offsite				
Concrete Truck	17	90	N/A	60
Worker Commute	15	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Water Truck	0.01	0.05	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.10	0.21	0.00	0.01	0.01
Offsite						
Concrete Truck	0.82	4.40	9.51	0.04	0.50	0.37
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	1.21	7.48	9.77	0.05	0.58	0.43
Total	1.23	7.58	9.98	0.05	0.59	0.44

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	1.7	0.0	1.7
Water Truck	2.1	0.0	2.1
Onsite Total	3.9	0.0	3.9
Offsite			
Concrete Truck	174.7	0.0	174.7
Worker Commute	40.8	0.0	40.8
Offsite Total	215.5	0.0	215.6
Total	219.4	0.0	219.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Water Truck	1	Unpaved	12.5	0.965	0.097	12.06	1.21
Onsite Total						21.72	2.17
Offsite							
Concrete Truck	17	Paved	60	0.001	0.000	0.82	0.00
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						22.44	2.17

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 12
Substation Construction Emissions
Civil

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

**Table 13
Substation Construction Emissions
Control Building**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.09	0.09	0.00	0.00	0.00	0.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	14.48	1.45	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.09	0.09	0.00	14.48	1.45	0.4
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	3.6
Total	0.17	1.32	0.20	0.00	14.80	1.47	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Carry-all Truck	2	20	2	5
Stake Truck	1	20	2	5
Offsite				
Worker Commute	6	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Carry-all Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 13
Substation Construction Emissions
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Carry-all Truck	0.01	0.06	0.06	0.00	0.00	0.00
Stake Truck	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.01	0.09	0.09	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.17	1.32	0.20	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Carry-all Truck	0.3	0.0	0.3
Stake Truck	0.1	0.0	0.1
Onsite Total	0.4	0.0	0.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	4.0	0.0	4.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Carry-all Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Stake Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Onsite Total						14.48	1.45
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						14.77	1.45

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 14
Substation Construction Emissions
Electrical**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.85	9.25	6.15	0.02	0.25	0.23	206.2
Onsite Motor Vehicle Exhaust	0.01	0.10	0.01	0.00	0.00	0.00	4.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	16.69	1.67	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.87	9.35	6.16	0.02	16.94	1.90	210.8
Offsite Motor Vehicle Exhaust	0.39	3.08	0.26	0.01	0.09	0.06	136.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.72	0.00	
Offsite Total	0.39	3.08	0.26	0.01	0.81	0.06	136.1
Total	1.26	12.43	6.41	0.03	17.75	1.96	346.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Scissor Lift	87	2	300	5
Manlift	43	2	300	7
Reach Manlift	87	2	300	6
15-Ton Crane	125	1	300	5

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Scissor Lift	0.18	2.26	1.50	0.00	0.06	0.06
Manlift	0.23	1.89	1.71	0.00	0.05	0.04
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.23	2.37	1.15	0.00	0.06	0.06
Total	0.85	9.25	6.15	0.02	0.25	0.23

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Scissor Lift	51.8	0.0	51.9
Manlift	37.4	0.0	37.4
Reach Manlift	62.2	0.0	62.2
15-Ton Crane	54.7	0.0	54.7
Total	206.0	0.0	206.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	6	300	2	5
Offsite				
Worker Commute	15	300	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

**Table 14
Substation Construction Emissions
Electrical**

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.10	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.39	3.08	0.26	0.01	0.09	0.06
Offsite Total	0.39	3.08	0.26	0.01	0.09	0.06
Total	0.40	3.19	0.27	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	4.5	0.0	4.5
Onsite Total	4.5	0.0	4.5
Offsite			
Worker Commute	136.0	0.0	136.1
Offsite Total	136.0	0.0	136.1
Total	140.6	0.0	140.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	6	Unpaved	5	0.556	0.056	16.69	1.67
Onsite Total						16.69	1.67
Offsite							
Worker Commute	15	Paved	60	0.001	0.000	0.72	0.00
Offsite Total						0.72	0.00
Total						17.41	1.67

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 15
Substation Construction Emissions
Wiring**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.07	0.54	0.49	0.00	0.01	0.01	8.9
Onsite Motor Vehicle Exhaust	0.01	0.07	0.01	0.00	0.00	0.00	2.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	11.13	1.11	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.08	0.61	0.49	0.00	11.14	1.13	11.4
Offsite Motor Vehicle Exhaust	0.21	1.65	0.14	0.01	0.05	0.03	60.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.21	1.65	0.14	0.01	0.43	0.03	60.5
Total	0.28	2.25	0.63	0.01	11.58	1.16	71.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	1	250	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.07	0.54	0.49	0.00	0.01	0.01

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	8.9	0.0	8.9
Total	8.9	0.0	8.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	250	2	5
Offsite				
Worker Commute	8	250	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 15
Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.07	0.01	0.00	0.00	0.00
Offsite						
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.21	1.65	0.14	0.01	0.05	0.03
Total	0.22	1.71	0.14	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	2.5	0.0	2.5
Onsite Total	2.5	0.0	2.5
Offsite			
Worker Commute	60.5	0.0	60.5
Offsite Total	60.5	0.0	60.5
Total	63.0	0.0	63.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	0.556	0.056	11.13	1.11
Onsite Total						11.13	1.11
Offsite							
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.38	0.00
Total						11.51	1.11

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 16
Substation Construction Emissions
Transformers**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.38	4.10	1.98	0.01	0.09	0.08	27.4
Onsite Motor Vehicle Exhaust	0.02	0.11	0.10	0.00	0.01	0.00	2.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	20.78	2.08	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.40	4.21	2.08	0.01	20.87	2.16	30.0
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	27.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	27.2
Total	0.66	6.27	2.25	0.01	21.41	2.20	57.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Crane	125	1	90	6
Forklift	83	1	90	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Crane	0.28	2.85	1.38	0.01	0.07	0.07
Forklift	0.10	1.25	0.60	0.00	0.01	0.01
Total	0.38	4.10	1.98	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Crane	19.7	0.0	19.7
Forklift	7.6	0.0	7.7
Total	27.3	0.0	27.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	4	90	2	5
Low Bed Truck	1	90	4	10
Offsite				
Worker Commute	10	90	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Low Bed Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 16
Substation Construction Emissions
Transformers

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Low Bed Truck	0.01	0.04	0.09	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.10	0.00	0.01	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.28	2.17	0.27	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.9	0.0	0.9
Low Bed Truck	1.7	0.0	1.7
Onsite Total	2.6	0.0	2.6
Offsite			
Worker Commute	27.2	0.0	27.2
Offsite Total	27.2	0.0	27.2
Total	29.8	0.0	29.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	4	Unpaved	5	0.556	0.056	11.13	1.11
Low Bed Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Onsite Total						20.78	2.08
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						21.26	2.08

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.02	0.12	0.12	0.00	0.01	0.00	1.6
Onsite Motor Vehicle Fugitive PM	--	--	--	--	15.20	1.52	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.02	0.12	0.12	0.00	15.21	1.52	1.6
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	7.3
Total	0.12	0.94	0.19	0.00	15.42	1.54	8.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Maintenance Truck	2	60	4	10
Offsite				
Worker Commute	4	60	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Maintenance Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 17
Substation Construction Emissions
Maintenance Crew Equipment Check

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Maintenance Truck	0.02	0.12	0.12	0.00	0.01	0.00
Onsite Total	0.02	0.12	0.12	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.94	0.19	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Maintenance Truck	1.6	0.0	1.6
Onsite Total	1.6	0.0	1.6
Offsite			
Worker Commute	7.3	0.0	7.3
Offsite Total	7.3	0.0	7.3
Total	8.8	0.0	8.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Maintenance Truck	2	Unpaved	10	0.760	0.076	15.20	1.52
Onsite Total						15.20	1.52
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						15.39	1.52

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 18
Substation Construction Emissions
Testing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.01	0.05	0.00	0.00	0.00	0.00	1.5
Onsite Motor Vehicle Fugitive PM	--	--	--	--	8.35	0.83	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.01	0.05	0.00	0.00	8.35	0.84	1.5
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	24.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	24.2
Total	0.11	0.87	0.07	0.00	8.56	0.85	25.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	200	3	7.5
Offsite				
Worker Commute	4	200	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 18
Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.01	0.05	0.00	0.00	0.00	0.00
Onsite Total	0.01	0.05	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.87	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	1.5	0.0	1.5
Onsite Total	1.5	0.0	1.5
Offsite			
Worker Commute	24.2	0.0	24.2
Offsite Total	24.2	0.0	24.2
Total	25.7	0.0	25.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Unpaved	7.5	0.556	0.056	8.35	0.83
Onsite Total						8.35	0.83
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						8.54	0.83

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 19
Substation Construction Emissions
Asphalting**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.33	4.62	0.01	0.21	0.19	12.0
Onsite Motor Vehicle Exhaust	0.02	0.11	0.17	0.00	0.01	0.01	1.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	22.45	2.25	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Asphaltic Paving VOC	0.6	--	--	--	--	--	--
Onsite Total	1.52	6.44	4.79	0.01	22.67	2.44	13.2
Offsite Motor Vehicle Exhaust	0.89	5.42	7.45	0.04	0.44	0.32	53.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.11	0.00	
Offsite Total	0.89	5.42	7.45	0.04	1.54	0.32	53.6
Total	2.41	11.86	12.23	0.05	24.21	2.77	66.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Paving Roller	46	2	30	4
Asphalt Paver	152	1	30	4
Tractor	45	1	30	3
Asphalt Curb Machine	35	1	30	3

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Paving Roller	46	0.034	0.226	0.178	0.000	0.007	0.006	25.983	0.003	Rollers
Asphalt Paver	152	0.090	0.754	0.524	0.001	0.029	0.026	128.285	0.008	Pavers
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Asphalt Curb Machine	35	0.047	0.235	0.179	0.000	0.010	0.009	23.927	0.004	Paving Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Paving Roller	0.28	1.81	1.42	0.00	0.05	0.05
Asphalt Paver	0.36	3.02	2.10	0.01	0.11	0.11
Tractor	0.09	0.80	0.57	0.00	0.01	0.01
Asphalt Curb Machine	0.14	0.71	0.54	0.00	0.03	0.03
Total	0.87	6.33	4.62	0.01	0.21	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Paving Roller	2.8	0.0	2.8
Asphalt Paver	7.0	0.0	7.0
Tractor	1.2	0.0	1.2
Asphalt Curb Machine	1.0	0.0	1.0
Total	12.0	0.0	12.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Stake Truck	1	30	4	10
Dump Truck	1	30	3	7.5
Crew Truck	2	30	2	5
Offsite				
Asphalt Delivery Truck	13	30	N/A	60
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Asphalt delivery trucks based on 3,900 CY over 30 days and 10 CY/truck = 3,900 / 30 / 10 = 13

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 19
Substation Construction Emissions
Asphalting

Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Asphalt Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Stake Truck	0.01	0.04	0.09	0.00	0.00	0.00
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.00	0.03	0.00	0.00	0.00	0.00
Onsite Total	0.02	0.11	0.17	0.00	0.01	0.01
Offsite						
Asphalt Delivery Truck	0.63	3.36	7.27	0.03	0.38	0.28
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.89	5.42	7.45	0.04	0.44	0.32
Total	0.91	5.53	7.61	0.04	0.45	0.33

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Stake Truck	0.6	0.0	0.6
Dump Truck	0.4	0.0	0.4
Crew Truck	0.2	0.0	0.2
Onsite Total	1.2	0.0	1.2
Offsite			
Asphalt Delivery Truck	44.5	0.0	44.5
Worker Commute	9.1	0.0	9.1
Offsite Total	53.6	0.0	53.6
Total	54.7	0.0	54.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Stake Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Dump Truck	1	Unpaved	7.5	0.965	0.097	7.24	0.72
Crew Truck	2	Unpaved	5	0.556	0.056	5.56	0.56
Onsite Total						22.45	2.25
Offsite							
Asphalt Delivery Truck	13	Paved	60	0.001	0.000	0.62	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.11	0.00
Total						23.56	2.25

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Asphaltic Paving VOC Emissions

Area Paved (acre/day) ^a	Emission Factor (lb/acre) ^b	VOC (lb/day) ^c
0.24	2.62	0.6

^a Assumed twice daily average for 156,000 ft² total in 30 days:

2 x 156,000 ft² / 30 days / 43,560 ft² per acre = 0.24 acres

^b From URBEMISS 2007 User's Guide, Appendix A,

<http://www.urbemis.com/software/download.html>

^c Emissions [lb/day] = Emission factor [lb/acre] x Area paved [acre/day]

Table 20
Substation Construction Emissions
Landscaping

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	2.71	1.73	0.00	0.03	0.03	6.9
Onsite Motor Vehicle Exhaust	0.01	0.10	0.08	0.00	0.01	0.00	1.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	18.37	1.84	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.30	2.81	1.80	0.00	18.41	1.87	8.0
Offsite Motor Vehicle Exhaust	1.42	8.26	13.60	0.06	0.76	0.56	136.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.63	0.00	
Offsite Total	1.42	8.26	13.60	0.06	2.39	0.56	136.9
Total	1.72	11.07	15.40	0.07	20.80	2.43	144.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Tractor	45	1	45	7
Forklift	83	1	45	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Tractor	45	0.032	0.268	0.190	0.000	0.004	0.003	30.347	0.003	Tractors/Loaders/Backhoes
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Tractor	0.22	1.87	1.33	0.00	0.03	0.02
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.29	2.71	1.73	0.00	0.03	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Tractor	4.3	0.0	4.3
Forklift	2.5	0.0	2.6
Total	6.9	0.0	6.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	1	45	3	7.5
Crew Truck	4	45	2	5
Offsite				
Crushed Rock Delivery Truck	24	45	N/A	60
Worker Commute	10	45	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Crushed rock delivery trucks based on 10,800 CY over 45 days and 10 CY/truck = 10,800 / 45 / 10 = 24

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Crushed Rock Delivery Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 20
Substation Construction Emissions
Landscaping

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.01	0.03	0.07	0.00	0.00	0.00
Crew Truck	0.01	0.07	0.01	0.00	0.00	0.00
Onsite Total	0.01	0.10	0.08	0.00	0.01	0.00
Offsite						
Crushed Rock Delivery Truck	1.15	6.21	13.43	0.06	0.70	0.52
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	1.42	8.26	13.60	0.06	0.76	0.56
Total	1.43	8.36	13.68	0.06	0.76	0.57

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.6	0.0	0.6
Crew Truck	0.5	0.0	0.5
Onsite Total	1.1	0.0	1.1
Offsite			
Crushed Rock Delivery Truck	123.3	0.0	123.3
Worker Commute	13.6	0.0	13.6
Offsite Total	136.9	0.0	136.9
Total	138.0	0.0	138.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	1	Unpaved	7.5	0.965	0.097	7.24	0.72
Crew Truck	4	Unpaved	5	0.556	0.056	11.13	1.11
Onsite Total						18.37	1.84
Offsite							
Crushed Rock Delivery Truck	24	Paved	60	0.001	0.000	1.15	0.00
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						1.63	0.00
Total						20.00	1.84

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 21
500 kV Transmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.11	0.89	0.08	0.00	0.03	0.02	0.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	9.30	0.91	
Offsite Total	0.11	0.89	0.08	0.00	9.32	0.93	0.5
Total	0.11	0.89	0.08	0.00	9.32	0.93	0.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1/2-Ton Pick-up Truck, 4x4	2	4	N/A	10
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1/2-Ton Pick-up Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 21
500 kV Transmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1/2-Ton Pick-up Truck, 4x4	0.01	0.07	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.11	0.89	0.08	0.00	0.03	0.02
Total	0.11	0.89	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1/2-Ton Pick-up Truck, 4x4	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	0.5	0.0	0.5
Total	0.5	0.0	0.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1/2-Ton Pick-up Truck, 4x4	2	Unpaved	10	0.455	0.046	9.10	0.91
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						9.30	0.91
Total						9.30	0.91

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.41	3.14	1.79	0.01	0.06	0.06	55.8
Onsite Motor Vehicle Exhaust	0.02	0.10	0.14	0.00	0.01	0.01	4.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	14.01	1.40	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.43	3.24	1.93	0.01	14.08	1.47	59.9
Offsite Motor Vehicle Exhaust	0.20	1.41	0.87	0.01	0.06	0.04	27.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.28	0.00	
Offsite Total	0.20	1.41	0.87	0.01	0.35	0.04	27.9
Total	0.63	4.65	2.81	0.02	14.43	1.51	87.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	137	5
Rough Terrain Forklift	125	1	137	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.27	1.16	1.35	0.01	0.05	0.04
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.41	3.14	1.79	0.01	0.06	0.06

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	34.8	0.0	34.9
Rough Terrain Forklift	20.9	0.0	20.9
Total	55.7	0.0	55.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	1	137	4	10
Jet A Fuel Truck	1	137	0.5	1.25
Water Truck	1	137	1	2.5
Offsite				
Flat Bed Truck/Trailer	1	10	N/A	60
Concrete Mixer Truck	1	10	N/A	10
Jet A Fuel Truck	1	137	N/A	20
Water Truck	1	137	N/A	20
Worker Commute	4	137	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Dump trucks based on 8,000 CY hauled offsite over 60 days and 10 CY/truck = 8,000 / 60 / 10 = 13.3

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4 Truck, Semi Tractor	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Flat Bed Truck/Trailer	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Jet A Fuel Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05

Table 22
500 kV Transmission Line Construction Emissions
Marshalling Yard

Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Jet A Fuel Truck	0.00	0.01	0.01	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.02	0.10	0.14	0.00	0.01	0.01
Offsite						
Flat Bed Truck/Trailer	0.06	0.36	0.37	0.00	0.02	0.01
Concrete Mixer Truck	0.01	0.06	0.06	0.00	0.00	0.00
Jet A Fuel Truck	0.02	0.09	0.19	0.00	0.01	0.01
Water Truck	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.20	1.41	0.87	0.01	0.06	0.04
Total	0.22	1.51	1.02	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Truck, Semi Tractor	1.3	0.0	1.3
Jet A Fuel Truck	0.33	0.00	0.33
Water Truck	0.65	0.00	0.65
Onsite Total	4.1	0.0	4.1
Offsite			
Flat Bed Truck/Trailer	0.8	0.0	0.8
Concrete Mixer Truck	0.1	0.0	0.1
Jet A Fuel Truck	5.21	0.00	5.21
Water Truck	5.21	0.00	5.21
Worker Commute	16.6	0.0	16.6
Offsite Total	27.9	0.0	27.9
Total	32.0	0.0	32.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	0.556	0.056	5.56	0.56
Truck, Semi Tractor	1	Unpaved	5	0.965	0.097	4.83	0.48
Jet A Fuel Truck	1	Unpaved	1.25	0.965	0.097	1.21	0.12
Water Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Onsite Total						14.01	1.40
Offsite							
Flat Bed Truck/Trailer	1	Paved	60	0.001	0.000	0.05	0.00
Concrete Mixer Truck	1	Paved	10	0.001	0.000	0.01	0.00
Jet A Fuel Truck	1	Paved	20	0.00	0.00	0.02	0.00
Water Truck	1	Paved	20	0.00	0.00	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.28	0.00
Total						14.29	1.40

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.09	16.82	9.96	0.05	0.45	0.42	44.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	9.17	1.91	
Onsite Total	2.09	16.82	9.96	0.05	9.63	2.33	44.9
Offsite Motor Vehicle Exhaust	0.28	2.18	0.37	0.01	0.07	0.05	8.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	20.52	2.00	
Offsite Total	0.28	2.18	0.37	0.01	20.59	2.05	8.3
Total	2.37	19.00	10.34	0.05	30.22	4.38	53.1

Construction Equipment Summary

Equipment	Horsepower	Number	Days Used	Hours Used/Day
Road Grader	250	1	24	6
Backhoe/Front Loader	125	1	24	8
Drum Type Compactor	100	1	24	6
Track Type Dozer	150	1	24	8
Excavator	250	1	24	6

Construction Equipment Exhaust Emission Factors

Equipment	Horsepower	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Track Type Dozer	0.66	5.81	3.56	0.01	0.19	0.18
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	2.09	16.82	9.96	0.05	0.45	0.42

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	11.2	0.0	11.3
Backhoe/Front Loader	8.8	0.0	8.8
Drum Type Compactor	3.9	0.0	3.9
Track Type Dozer	10.6	0.0	10.6
Excavator	10.4	0.0	10.4
Total	44.8	0.0	44.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	24	N/A	5
Water Truck	2	24	N/A	5
Lowboy Truck/Trailer	1	24	N/A	5
Worker Commute	10	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.01	0.04	0.09	0.00	0.00	0.00
Lowboy Truck/Trailer	0.00	0.02	0.05	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.28	2.18	0.37	0.01	0.07	0.05
Total	0.28	2.18	0.37	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.5	0.0	0.5
Lowboy Truck/Trailer	0.2	0.0	0.2
Worker Commute	7.3	0.0	7.3
Offsite Total	8.3	0.0	8.3
Total	8.3	0.0	8.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Water Truck	2	Unpaved	5	0.965	0.097	9.65	0.97
Lowboy Truck/Trailer	1	Unpaved	5	0.965	0.097	4.83	0.48
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						20.52	2.00
Total						20.52	2.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Table 23
500 kV Transmission Line Construction Emissions
Roads and Landing Work

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	4,334	9.94E-04	2.07E-04	4.31	0.90
Bulldozing, Scraping and Grading	hr/day	14	0.348	0.072	4.87	1.01
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					9.17	1.91

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate 80,000 CY of cut plus 50,000 CY of fill yields 130,000 CY of soil handling over 30 days. Approx 4,334 CY/day.

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	28.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	1.38	0.29	
Onsite Total	1.15	15.80	7.68	0.03	1.62	0.51	28.5
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	4.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	4.4
Total	1.30	17.03	7.78	0.03	1.94	0.53	32.9

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	24	8
Grout Machine	60	1	24	8
Drill Rig	75	1	24	8
Transfer Pump	60	1	24	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	7.7	0.0	7.7
Grout Machine	7.0	0.0	7.0
Drill Rig	6.7	0.0	6.7
Transfer Pump	7.0	0.0	7.0
Total	28.5	0.0	28.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	24	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 23b
500 kV Transmission Line Construction Emissions
Install Helicopter Platforms

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	4.4	0.0	4.4
Offsite Total	4.4	0.0	4.4
Total	4.4	0.0	4.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	1,388	9.94E-04	2.07E-04	1.38	0.29
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					1.38	0.29

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.75	4.54	3.93	0.02	0.16	0.15	2.6
Offsite Motor Vehicle Exhaust	0.27	2.03	0.63	0.01	0.07	0.05	1.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	47.51	4.71	
Offsite Total	0.27	2.03	0.63	0.01	47.58	4.76	1.4
Total	1.02	6.57	4.56	0.02	47.74	4.91	4.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	4	8
Rough Terrain Crane (L)	275	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Rough Terrain Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Rough Terrain Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.75	4.54	3.93	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.7	0.0	0.7
Rough Terrain Crane (L)	2.0	0.0	2.0
Total	2.6	0.0	2.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
1-Ton Flat Bed, 4x4	2	4	N/A	20
Flat Bed Truck/Trailer	1	4	N/A	20
Worker Commute	8	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHV	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 24
500 kV Transmission Line Construction Emissions
Tower Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
1-Ton Flat Bed, 4x4	0.04	0.24	0.25	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.27	2.03	0.63	0.01	0.07	0.05
Total	0.27	2.03	0.63	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
1-Ton Flat Bed, 4x4	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.2	0.0	0.2
Worker Commute	1.0	0.0	1.0
Offsite Total	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.ciimateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
1-Ton Flat Bed, 4x4	2	Unpaved	20	0.556	0.056	22.26	2.23
Flat Bed Truck/Trailer	1	Unpaved	20	0.965	0.097	19.30	1.93
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						47.51	4.71
Total						47.51	4.71

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.48	5.92	2.51	0.01	0.11	0.10	0.9
Offsite Motor Vehicle Exhaust	0.13	0.97	0.22	0.00	0.03	0.02	0.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	22.28	2.21	
Offsite Total	0.13	0.97	0.22	0.00	22.31	2.23	0.6
Total	0.61	6.89	2.73	0.01	22.42	2.33	1.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	2	8
Backhoe/Front Loader	125	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Total	0.48	5.92	2.51	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.3	0.0	0.3
Backhoe/Front Loader	0.6	0.0	0.6
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	1	4	N/A	5
Dump Truck	1	2	N/A	20
Worker Commute	4	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 25
500 kV Transmission Line Construction Emissions
Foundation Removal

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.00	0.03	0.03	0.00	0.00	0.00
Dump Truck	0.02	0.12	0.12	0.00	0.01	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.22	0.00	0.03	0.02
Total	0.13	0.97	0.22	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.0	0.0	0.0
Dump Truck	0.1	0.0	0.1
Worker Commute	0.5	0.0	0.5
Offsite Total	0.6	0.0	0.6
Total	0.6	0.0	0.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	1	Unpaved	5	0.556	0.056	2.78	0.28
Dump Truck	1	Unpaved	20	0.965	0.097	19.30	1.93
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						22.28	2.21
Total						22.28	2.21

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.73	13.83	6.02	0.05	0.23	0.21	53.6
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	--
Earthwork Fugitive PM	--	--	--	--	0.20	0.04	--
Onsite Total	1.73	13.83	6.02	0.05	0.43	0.26	53.6
Offsite Motor Vehicle Exhaust	0.28	2.10	0.64	0.01	0.08	0.05	10.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	48.42	4.80	--
Offsite Total	0.28	2.10	0.64	0.01	48.49	4.85	10.1
Total	2.01	15.93	6.66	0.06	48.92	5.11	63.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	30	7
Backhoe/Front Loader	125	1	30	10
Low Drill	385	1	16	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Low Drill	385	0.071	0.551	0.162	0.003	0.006	0.005	311.309	0.006	Bore/Drill Rigs

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.60	2.47	2.78	0.01	0.10	0.09
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Low Drill	0.71	5.51	1.62	0.03	0.06	0.05
Total	1.73	13.83	6.02	0.05	0.23	0.21

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	17.2	0.0	17.2
Backhoe/Front Loader	13.8	0.0	13.8
Low Drill	22.6	0.0	22.6
Total	53.5	0.0	53.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	30	N/A	5
Water Truck	1	30	N/A	5
Dump Truck	1	30	N/A	10
Concrete Mixer Truck	3	18	N/A	10
Worker Commute	9	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Dump Truck	0.01	0.04	0.09	0.00	0.00	0.00
Concrete Mixer Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.24	1.85	0.16	0.01	0.05	0.03
Offsite Total	0.28	2.10	0.64	0.01	0.08	0.05
Total	0.28	2.10	0.64	0.01	0.08	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
Water Truck	0.3	0.0	0.3
Dump Truck	0.6	0.0	0.6
Concrete Mixer Truck	1.0	0.0	1.0
Worker Commute	8.2	0.0	8.2
Offsite Total	10.0	0.0	10.1
Total	10.0	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	5	0.455	0.046	4.55	0.46
Water Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Dump Truck	1	Unpaved	10	0.965	0.097	9.65	0.97
Concrete Mixer Truck	3	Unpaved	10	0.965	0.097	28.95	2.90
Worker Commute	9	Paved	60	0.001	0.000	0.43	0.00
Offsite Total						48.42	4.80
Total						48.42	4.80

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	200	9.94E-04	2.07E-04	0.20	0.04
Buildozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.20	0.04

^a From Table 57

Table 26
500 kV Transmission Line Construction Emissions
Tower Foundations Installation

^a Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]
^b Estimate

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	15.80	7.68	0.03	0.24	0.22	104.7
Offsite Motor Vehicle Exhaust	0.16	1.23	0.10	0.00	0.03	0.02	17.4
Offsite Helicopter Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.16	1.23	0.10	0.00	0.32	0.02	17.4
Total	1.30	17.03	7.78	0.03	0.56	0.24	122.1

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor	150	1	96	8
Grout Machine	60	1	80	8
Drill Rig	75	1	96	8
Transfer Pump	60	1	80	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	0.042814	0.500686	0.28637	0.001746	0.0041623	PM2.5 (lb/hr) ^b	164.8678	0.003863	Category
Compressor	150	0.042	0.500	0.219	0.001	0.010	0.010	88.483	0.004	Air Compressors
Grout Machine	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment
Drill Rig	75	0.025	0.466	0.195	0.001	0.002	0.002	77.122	0.002	Bore/Drill Rigs
Transfer Pump	60	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor	0.34	4.00	1.75	0.01	0.08	0.08
Grout Machine	0.30	4.04	2.18	0.01	0.07	0.06
Drill Rig	0.20	3.73	1.56	0.01	0.02	0.01
Transfer Pump	0.30	4.04	2.18	0.01	0.07	0.06
Total	1.15	15.80	7.68	0.03	0.24	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor	30.8	0.0	30.9
Grout Machine	23.5	0.0	23.5
Drill Rig	26.9	0.0	26.9
Transfer Pump	23.5	0.0	23.5
Total	104.6	0.0	104.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT].
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Worker Commute	6	96	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 26b
500 kV Transmission Line Construction Emissions
Install Micropile Foundations

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.16	1.23	0.10	0.00	0.03	0.02
Total	0.16	1.23	0.10	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	17.4	0.0	17.4
Offsite Total	17.4	0.0	17.4
Total	17.4	0.0	17.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^a From Table 56

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.29	0.00
Total						0.29	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.18	2.65	0.59	0.01	0.02	0.02	2.0
Offsite Motor Vehicle Exhaust	0.13	0.97	0.32	0.00	0.04	0.02	1.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	25.06	2.49	
Offsite Total	0.13	0.97	0.32	0.00	25.10	2.51	1.7
Total	0.31	3.62	0.90	0.01	25.12	2.53	3.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.18	2.65	0.59	0.01	0.02	0.02
Total	0.18	2.65	0.59	0.01	0.02	0.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	2	10	N/A	5
Flat Bed Truck/Trailer	1	10	N/A	20
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 27
500 kV Transmission Line Construction Emissions
Tower Steel Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Flat Bed Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	0.97	0.32	0.00	0.04	0.02
Total	0.13	0.97	0.32	0.00	0.04	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	0.1	0.0	0.1
Flat Bed Truck/Trailer	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.7	0.0	1.7
Total	1.7	0.0	1.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Flat Bed Truck/Trailer	1	Unpaved	20	0.965	0.097	19.30	1.93
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						25.06	2.49
Total						25.06	2.49

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.70	5.79	3.60	0.02	0.14	0.13	25.2
Offsite Motor Vehicle Exhaust	0.29	2.24	0.36	0.01	0.07	0.04	13.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	15.15	1.47	
Offsite Total	0.29	2.24	0.36	0.01	15.22	1.51	13.7
Total	0.98	8.03	3.96	0.02	15.36	1.64	38.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	40	6
RT Crane (M)	215	1	40	6
Compressor Trailer	60	1	40	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.70	5.79	3.60	0.02	0.14	0.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	6.1	0.0	6.1
RT Crane (M)	12.2	0.0	12.2
Compressor Trailer	6.8	0.0	6.8
Total	25.1	0.0	25.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	40	N/A	10
1-Ton Crew Cab Flat Bed, 4x4	2	40	N/A	5
Worker Commute	10	40	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 28
500 kV Transmission Line Construction Emissions
Tower Steel Assembly

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.02	0.12	0.12	0.00	0.01	0.00
1-Ton Crew Cab Flat Bed, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.29	2.24	0.36	0.01	0.07	0.04
Total	0.29	2.24	0.36	0.01	0.07	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.0	0.0	1.0
1-Ton Crew Cab Flat Bed, 4x4	0.5	0.0	0.5
Worker Commute	12.1	0.0	12.1
Offsite Total	13.7	0.0	13.7
Total	13.7	0.0	13.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	10	0.455	0.046	9.10	0.91
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						15.15	1.47
Total						15.15	1.47

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.07	5.93	5.55	0.02	0.21	0.20	17.7
Offsite Motor Vehicle Exhaust	0.38	2.91	0.67	0.01	0.09	0.06	15.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	37.75	3.72	
Offsite Total	0.38	2.91	0.67	0.01	37.85	3.78	15.2
Total	1.46	8.84	6.22	0.03	38.06	3.98	33.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	33	8
RT Crane (M)	215	1	22	6
RT Crane (L)	275	1	11	6

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
RT Crane (L)	275	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
RT Crane (M)	0.33	1.39	1.62	0.01	0.06	0.05
RT Crane (L)	0.51	2.12	2.39	0.01	0.09	0.08
Total	1.07	5.93	5.55	0.02	0.21	0.20

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	5.6	0.0	5.6
RT Crane (M)	6.7	0.0	6.7
RT Crane (L)	5.4	0.0	5.4
Total	17.7	0.0	17.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	3	33	N/A	15
1-Ton Crew Cab Flat Bed, 4x4	2	33	N/A	15
Worker Commute	12	33	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29
500 kV Transmission Line Construction Emissions
Tower Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.04	0.27	0.28	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.31	2.47	0.21	0.01	0.07	0.05
Offsite Total	0.38	2.91	0.67	0.01	0.09	0.06
Total	0.38	2.91	0.67	0.01	0.09	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	1.9	0.0	1.9
1-Ton Crew Cab Flat Bed, 4x4	1.3	0.0	1.3
Worker Commute	12.0	0.0	12.0
Offsite Total	15.2	0.0	15.2
Total	15.2	0.0	15.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	3	Unpaved	15	0.455	0.046	20.48	2.05
1-Ton Crew Cab Flat Bed, 4x4	2	Unpaved	15	0.556	0.056	16.69	1.67
Worker Commute	12	Paved	60	0.001	0.000	0.58	0.00
Offsite Total						37.75	3.72
Total						37.75	3.72

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29b

**500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.59	4.56	0.81	0.01	0.14	0.09	5.0
Offsite Helicopter Exhaust	0.23	2.42	1.54	0.00	0.07	0.07	1.36
Offsite Motor Vehicle Fugitive PM	--	--	--	--	42.75	4.18	
Offsite Total	0.82	6.98	2.35	0.02	42.96	4.34	6.4
Total	0.82	6.98	2.35	0.02	42.96	4.34	6.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	8	8

Note: Helicopter use accounted for in Table 29c

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.23	2.42	1.54	0.00	0.07	0.07

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	2	N/A	15
1-Ton Truck, 4x4	2	2	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	15
Worker Commute	20	8	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29b
500 kV Transmission Line Construction Emissions
Tower Erection (Helicopter) Ground Support

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Fuel, Helicopter Support Truck	0.01	0.09	0.09	0.00	0.00	0.00
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.59	4.56	0.81	0.01	0.14	0.09
Total	0.59	4.56	0.81	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.1	0.0	0.1
1-Ton Truck, 4x4	0.1	0.0	0.1
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	4.8	0.0	4.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Unpaved	15	0.455	0.046	13.66	1.37
1-Ton Truck, 4x4	2	Unpaved	15	0.455	0.046	13.66	1.37
Fuel, Helicopter Support Truck	1	Unpaved	15	0.965	0.097	14.48	1.45
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						42.75	4.18
Total						42.75	4.18

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 29c

**500 kV Transmission Line Construction Emissions
Tower Helicopter Operations**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Helicopter Exhaust	46.71	56.80	577.42	32.18	12.02	12.02	1626.43
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Offsite Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4
Total	46.71	56.80	577.42	32.18	12.02	12.02	1626.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Kaman K-Max	1500	1	120	8
Hughes 500E Helicopter	317	1	127	12
Sikorsky S64	9000	1	7	12

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Kaman K-Max	1500	1.129	1.353	7.403	0.626	0.201	0.201	1978.170	0.055	See note c
Hughes 500E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039	0.019	See note c
Sikorsky S64	9000	1.786	2.088	47.051	2.464	0.966	0.966	7788.012	0.216	See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5, CO2, and CH4 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications,

DETEC, Federal Office of Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009.

Downloaded from <http://www.bazl.admin.ch/experten/regulation/03312/03419/03532/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.75 kg/gal from Table 13.1 of 2013 Climate Registry Default Emission Factors, downloaded from

<http://www.theclimaterestry.org/downloads/2013/01/2013-Climat-Registry-Default-Emissions-Factors.pdf>

CH4 emission factor = 0.27 g/gal from Table 13.7 of 2013 Climate Registry Default Emission Factors

K-Max Fuel use = 283.86 kg/hr from Guidance on the Determination of Helicopter Emissions

Hughes 500E Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Sikorsky S64 Fuel use = 1,118 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Kaman K-Max	9.03	10.83	59.22	5.01	1.60	1.60
Hughes 500E Helicopter	25.27	31.74	12.80	2.61	0.42	0.42
Sikorsky S64	21.44	25.06	564.62	29.57	11.60	11.60
Total^b	46.71	56.80	577.42	32.18	12.02	12.02

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

^b Total daily emissions assume that the Kaman K-Max and Sikorsky S64 would not operate on the same day.

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Kaman K-Max	861.4	0.0	861.9
Hughes 500E Helicopter	467.3	0.0	467.6
Sikorsky S64	296.7	0.0	296.9
Total	1,625.5	0.0	1,626.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO2-equivalent (CO2e) emission factors are CO2 emissions plus 21 x CH4 emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateestry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
None				

^a Onsite travel based on 25% use at 10 mph average speed.

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Fuel, Helicopter Support Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 29c
500 kV Transmission Line Construction Emissions
Tower Helicopter Operations

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
1-Ton Truck, 4x4	0.00	0.00	0.00	0.00	0.00	0.00
Fuel, Helicopter Support Truck	0.00	0.00	0.00	0.00	0.00	0.00
Worker Commute	0.00	0.00	0.00	0.00	0.00	0.00
Offsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.0	0.0	0.0
1-Ton Truck, 4x4	0.0	0.0	0.0
Fuel, Helicopter Support Truck	0.0	0.0	0.0
Worker Commute	0.0	0.0	0.0
Offsite Total	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
None						0.00	0.00
Offsite Total						0.00	0.00
Total						0.00	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	5.93	32.28	29.00	0.15	1.00	0.92	0.00
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	5.93	32.28	29.00	0.15	1.00	0.92	0.0
Offsite Motor Vehicle Exhaust	1.70	12.93	3.12	0.04	0.42	0.29	18.5
Offsite Helicopter Exhaust	12.64	15.87	6.40	1.31	0.21	0.21	0.00
Offsite Motor Vehicle Fugitive PM	--	--	--	--	173.42	17.08	
Offsite Total	14.34	28.80	9.52	1.35	174.06	17.58	18.5
Total	20.27	61.08	38.52	1.51	175.06	18.50	18.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	2	9	8
RT Crane (M)	215	2	9	6
Boom/Crane Truck	350	2	9	6
Spacing Cart	10	2	3	8
Static Truck/Tensioner	350	1	9	6
3 Drum Straw Sock Puller	300	1	4	6
Bull Wheel Puller	525	1	5	6
Sag Cat w/ winches	350	2	9	4
Backhoe/Front Loader	125	1	9	4
D8 Cat	350	2	9	4
Hughes 500 E Helicopter	N/A	1	2	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
RT Crane (M)	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Spacing Cart	10	0.012	0.062	0.074	0.000	0.003	0.003	10.107	0.001	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Sock Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Bull Wheel Puller	525	0.044	0.347	0.202	0.001	0.007	0.006	122.505	0.004	Other Construction Equipment
Sag Cat w/ winches	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
D8 Cat	350	0.139	0.588	0.753	0.003	0.028	0.026	259.229	0.013	Crawler Tractors
Hughes 500 E Helicopter	317	2.106	2.645	1.067	0.218	0.035	0.035	676.039		See note c

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

^c All except SOx, PM2.5 and CO2 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications, DETEC, Federal Office of

Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009. Downloaded from <http://www.bazl.admin.ch/fachleute/01169/01174/01628/index.html?lang=en>

PM2.5 emissions assumed equal to PM10

SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Fuel sulfur = 0.05% from estimated average for Jet-A

CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]

CO2 emission factor = 9.57 kg/gal from Table C.3 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008.

Downloaded from http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions

Jet-A density = 6.8 lb/gal

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.93	5.94	5.86	0.03	0.17	0.16
RT Crane (M)	0.65	2.78	3.25	0.02	0.11	0.10
Boom/Crane Truck	1.03	4.24	4.77	0.02	0.18	0.16
Spacing Cart	0.19	0.99	1.18	0.00	0.05	0.04
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
3 Drum Straw Sock Puller	0.48	2.76	1.82	0.01	0.06	0.05
Bull Wheel Puller	0.27	2.08	1.21	0.01	0.04	0.04
Sag Cat w/ winches	0.63	3.68	2.43	0.02	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
D8 Cat	1.11	4.70	6.02	0.02	0.22	0.21
Hughes 500 E Helicopter	12.64	15.87	6.40	1.31	0.21	0.21
Total	18.56	48.15	35.40	1.46	1.21	1.13

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	13.9	0.0	13.9
RT Crane (M)	5.5	0.0	5.5
Boom/Crane Truck	8.8	0.0	8.8
Spacing Cart	0.2	0.0	0.2
Static Truck/Tensioner	6.2	0.0	6.2
3 Drum Straw Sock Puller	2.8	0.0	2.8
Bull Wheel Puller	1.7	0.0	1.7
Sag Cat w/ winches	8.3	0.0	8.3
Backhoe/Front Loader	1.7	0.0	1.7
D8 Cat	8.5	0.0	8.5
Hughes 500 E Helicopter	3.7	0.0	3.7
Total	61.2	0.0	61.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	4	9	N/A	20
1-Ton Crew Cab, 4x4	6	9	N/A	20
Wire Truck/Trailer	4	6	N/A	5
Dump Truck	1	9	N/A	5
Lowboy Truck/Trailer	3	9	N/A	15
Fuel, Helicopter Support Truck	1	2	N/A	30
Worker Commute	55	9	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Fuel, Helicopter Support Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 30
500 kV Transmission Line Construction Emissions
Wire Stringing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.07	0.48	0.49	0.00	0.02	0.02
1-Ton Crew Cab, 4x4	0.11	0.71	0.74	0.00	0.03	0.03
Wire Truck/Trailer	0.02	0.09	0.19	0.00	0.01	0.01
Dump Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.04	0.19	0.42	0.00	0.02	0.02
Fuel, Helicopter Support Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	1.44	11.31	0.95	0.04	0.32	0.21
Offsite Total	1.70	12.93	3.12	0.04	0.42	0.29
Total	1.70	12.93	3.12	0.04	0.42	0.29

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.9	0.0	0.9
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Wire Truck/Trailer	0.2	0.0	0.2
Dump Truck	0.1	0.0	0.1
Lowboy Truck/Trailer	0.8	0.0	0.8
Fuel, Helicopter Support Truck	0.1	0.0	0.1
Worker Commute	15.0	0.0	15.0
Offsite Total	18.5	0.0	18.5
Total	18.5	0.0	18.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	4	Unpaved	20	0.455	0.046	36.42	3.64
1-Ton Crew Cab, 4x4	6	Unpaved	20	0.556	0.056	66.77	6.68
Wire Truck/Trailer	4	Unpaved	5	0.965	0.097	19.30	1.93
Dump Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Lowboy Truck/Trailer	3	Unpaved	15	0.965	0.097	43.43	4.34
Fuel, Helicopter Support Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	55	Paved	60	0.001	0.000	2.64	0.00
Offsite Total						173.42	17.08
Total						173.42	17.08

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.87	6.75	4.42	0.02	0.19	0.17	3.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	2.58	0.54	
Onsite Total	0.87	6.75	4.42	0.02	2.77	0.71	3.3
Offsite Motor Vehicle Exhaust	0.20	1.56	0.32	0.01	0.05	0.03	1.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	20.38	2.00	
Offsite Total	0.20	1.56	0.32	0.01	20.43	2.04	1.0
Total	1.08	8.31	4.75	0.03	23.20	2.75	4.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	4	6
Backhoe/Front Loader	125	1	4	4
Drum Type Compactor	100	1	4	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.17	2.34	0.65	0.00	0.03	0.03
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.87	6.75	4.42	0.02	0.19	0.17

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	1.9	0.0	1.9
Backhoe/Front Loader	0.7	0.0	0.7
Drum Type Compactor	0.6	0.0	0.6
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
1-Ton Crew Cab, 4x4	2	4	N/A	5
Water Truck	1	4	N/A	5
Lowboy Truck/Trailer	1	4	N/A	10
Worker Commute	7	4	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 31
500 kV Transmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Water Truck	0.00	0.02	0.05	0.00	0.00	0.00
Lowboy Truck/Trailer	0.01	0.04	0.09	0.00	0.00	0.00
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.20	1.56	0.32	0.01	0.05	0.03
Total	0.20	1.56	0.32	0.01	0.05	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.1	0.0	0.1
Water Truck	0.0	0.0	0.0
Lowboy Truck/Trailer	0.1	0.0	0.1
Worker Commute	0.8	0.0	0.8
Offsite Total	1.0	0.0	1.0
Total	1.0	0.0	1.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None						0.00	0.00
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Unpaved	5	0.556	0.056	5.56	0.56
Water Truck	1	Unpaved	5	0.965	0.097	4.83	0.48
Lowboy Truck/Trailer	1	Unpaved	10	0.965	0.097	9.65	0.97
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						20.38	2.00
Total						20.38	2.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day	6	0.348	0.072	2.09	0.43
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					2.58	0.54

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.12	0.96	0.08	0.00	0.03	0.02	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5
Total	0.12	0.96	0.08	0.00	0.25	0.02	2.5

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	18	8	20
Worker Commute	4	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 32
115 kV Subtransmission Line Construction Emissions
Survey

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.02	0.14	0.01	0.00	0.00	0.00
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.12	0.96	0.08	0.00	0.03	0.02
Total	0.12	0.96	0.08	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.4	0.0	0.4
Worker Commute	2.2	0.0	2.2
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	20	0.001	0.000	0.03	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.25	2.45	0.98	0.01	0.04	0.03	92.9
Onsite Motor Vehicle Exhaust	0.01	0.08	0.11	0.00	0.01	0.00	8.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	10.39	1.04	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.26	2.53	1.09	0.01	10.43	1.08	101.1
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	44.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	44.2
Total	0.36	3.35	1.16	0.01	10.65	1.09	145.3

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	215	1	365	2
Rough Terrain Forklift	125	1	365	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	215	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.11	0.46	0.54	0.00	0.02	0.02
Rough Terrain Forklift	0.14	1.99	0.44	0.00	0.02	0.02
Total	0.25	2.45	0.98	0.01	0.04	0.03

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	37.1	0.0	37.2
Rough Terrain Forklift	55.7	0.0	55.7
Total	92.8	0.0	92.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Crew Cab, 4x4	1	365	4	10
Truck, Semi Tractor	1	365	2	5
Offsite				
Worker Commute	4	365	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Truck, Semi Tractor	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 33
115 kV Subtransmission Line Construction Emissions
Marshalling Yard

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Crew Cab, 4x4	0.01	0.06	0.06	0.00	0.00	0.00
Truck, Semi Tractor	0.00	0.02	0.05	0.00	0.00	0.00
Onsite Total	0.01	0.08	0.11	0.00	0.01	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.12	0.90	0.18	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Crew Cab, 4x4	4.8	0.0	4.8
Truck, Semi Tractor	3.5	0.0	3.5
Onsite Total	8.2	0.0	8.2
Offsite			
Worker Commute	44.1	0.0	44.2
Offsite Total	44.1	0.0	44.2
Total	52.4	0.0	52.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Crew Cab, 4x4	1	Unpaved	10	0.556	0.056	5.56	0.56
Truck, Semi Tractor	1	Unpaved	5	0.965	0.097	4.83	0.48
Onsite Total						10.39	1.04
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						10.58	1.04

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.60	12.73	7.49	0.04	0.34	0.31	109.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.97	0.10	
Earthwork Fugitive PM	--	--	--	--	3.58	0.74	
Onsite Total	1.60	12.73	7.50	0.04	4.88	1.15	109.5
Offsite Motor Vehicle Exhaust	0.18	1.34	0.55	0.01	0.05	0.04	19.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.29	0.00	
Offsite Total	0.18	1.34	0.55	0.01	0.34	0.04	19.3
Total	1.79	14.07	8.05	0.04	5.22	1.19	128.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	88	4
Backhoe/Front Loader	125	1	88	6
Drum Type Compactor	100	1	88	4
Track Type Dozer	150	1	88	6
Excavator	250	1	44	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers
Track Type Dozer	150	0.082	0.727	0.445	0.001	0.024	0.022	121.188	0.007	Crawler Tractors
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.31	1.42	1.46	0.01	0.05	0.05
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.16	1.52	1.06	0.00	0.05	0.05
Track Type Dozer	0.49	4.36	2.67	0.01	0.14	0.13
Excavator	0.39	1.93	1.33	0.01	0.04	0.04
Total	1.60	12.73	7.49	0.04	0.34	0.31

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	27.5	0.0	27.5
Backhoe/Front Loader	24.3	0.0	24.3
Drum Type Compactor	9.4	0.0	9.4
Track Type Dozer	29.0	0.0	29.1
Excavator	19.0	0.0	19.0
Total	109.2	0.0	109.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	88	8	1
Offsite				
1-Ton Crew Cab, 4x4	1	88	N/A	30
Lowboy Truck/Trailer	1	44	N/A	30
Worker Commute	5	88	N/A	60

Table 34
115 kV Subtransmission Line Construction Emissions
Roads and Landing Work

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.13	1.03	0.09	0.00	0.03	0.02
Offsite Total	0.18	1.34	0.55	0.01	0.05	0.04
Total	0.18	1.34	0.56	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab, 4x4	3.5	0.0	3.5
Lowboy Truck/Trailer	2.5	0.0	2.5
Worker Commute	13.3	0.0	13.3
Offsite Total	19.3	0.0	19.3
Total	19.4	0.0	19.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	0.965	0.097	0.97	0.10
Onsite Total						0.97	0.10
Offsite							
1-Ton Crew Cab, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	5	Paved	60	0.001	0.000	0.24	0.00
Offsite Total						0.29	0.00
Total						1.25	0.10

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	100	9.94E-04	2.07E-04	0.10	0.02
Bulldozing, Scraping and Grading	hr/day	10	0.348	0.072	3.48	0.72
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					3.58	0.74

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.35	8.18	6.39	0.04	0.23	0.22	43.7
Offsite Motor Vehicle Exhaust	0.26	1.90	0.94	0.01	0.07	0.05	9.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.26	1.90	0.94	0.01	0.46	0.05	9.3
Total	1.61	10.08	7.33	0.05	0.69	0.27	53.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	26	6
Auger Truck	210	1	26	6
Boom/Crane Truck	350	1	26	8
Bucket Truck	250	1	26	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.17	1.81	1.16	0.00	0.05	0.05
Auger Truck	0.26	2.06	0.59	0.01	0.02	0.02
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.35	8.18	6.39	0.04	0.23	0.22

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	3.3	0.0	3.3
Auger Truck	13.3	0.0	13.3
Boom/Crane Truck	17.0	0.0	17.0
Bucket Truck	10.0	0.0	10.0
Total	43.7	0.0	43.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Pick-up Truck, 4x4	2	26	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	26	N/A	30
Extendable Flat Bed Pole Truck	1	26	N/A	30
Worker Commute	6	26	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 35
115 kV Subtransmission Line Construction Emissions
Guard Structure Installation

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Pick-up Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Pick-up Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.26	1.90	0.94	0.01	0.07	0.05
Total	0.26	1.90	0.94	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Pick-up Truck, 4x4	2.0	0.0	2.0
1-Ton Crew Cab Flat Bed, 4x4	1.0	0.0	1.0
Extendable Flat Bed Pole Truck	1.5	0.0	1.5
Worker Commute	4.7	0.0	4.7
Offsite Total	9.3	0.0	9.3
Total	9.3	0.0	9.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Pick-up Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.38	0.00
Total						0.38	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.84	5.86	4.22	0.02	0.17	0.16	17.5
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	7.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	7.3
Total	1.07	7.58	4.97	0.02	0.60	0.20	24.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Rough Terrain Forklift	125	1	23	4
Boom/Crane Truck	350	1	23	6
Compressor Trailer	60	1	23	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Rough Terrain Forklift	125	0.023	0.331	0.073	0.001	0.003	0.003	56.054	0.002	Forklifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Rough Terrain Forklift	0.09	1.32	0.29	0.00	0.01	0.01
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Compressor Trailer	0.23	2.42	1.54	0.00	0.07	0.07
Total	0.84	5.86	4.22	0.02	0.17	0.16

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Rough Terrain Forklift	2.3	0.0	2.3
Boom/Crane Truck	11.3	0.0	11.3
Compressor Trailer	3.9	0.0	3.9
Total	17.5	0.0	17.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	23	N/A	30
Flat Bed Truck/Trailer	1	23	N/A	30
Worker Commute	6	23	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 36
115 kV Subtransmission Line Construction Emissions
Remove Existing Wood H-Frames and Poles

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Flat Bed Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	1.8	0.0	1.8
Flat Bed Truck/Trailer	1.3	0.0	1.3
Worker Commute	4.2	0.0	4.2
Offsite Total	7.3	0.0	7.3
Total	7.3	0.0	7.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Flat Bed Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	3.0
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	2.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	2.0
Total	0.98	5.99	4.23	0.02	0.69	0.18	5.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	5	5
Boom/Crane Truck	350	1	5	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	0.5	0.0	0.5
Boom/Crane Truck	2.5	0.0	2.5
Total	3.0	0.0	3.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				
Offsite				
3/4-Ton Truck, 4x4	2	5	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	5	N/A	30
Worker Commute	8	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 37
115 kV Subtransmission Line Construction Emissions
Remove Existing Tubular Steel/Light Weight Steel Poles

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.4	0.0	0.4
1-Ton Crew Cab Flat Bed, 4x4	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	2.0	0.0	2.0
Total	2.0	0.0	2.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.11	9.18	4.06	0.03	0.16	0.15	119.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.01	0.00	0.00	0.00	0.2
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.97	0.10	
Earthwork Fugitive PM	--	--	--	--	0.03	0.01	
Onsite Total	1.11	9.18	4.07	0.03	1.16	0.25	119.2
Offsite Motor Vehicle Exhaust	0.31	2.14	1.43	0.01	0.11	0.08	40.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.38	0.00	
Offsite Total	0.31	2.14	1.43	0.01	0.49	0.08	40.7
Total	1.41	11.32	5.50	0.05	1.65	0.33	159.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	96	5
Backhoe/Front Loader	125	1	96	8
Auger Truck	210	1	65	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Auger Truck	210	0.043	0.343	0.098	0.002	0.004	0.003	188.102	0.004	Bore/Drill Rigs

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.43	1.77	1.99	0.01	0.07	0.07
Backhoe/Front Loader	0.34	4.67	1.29	0.01	0.06	0.05
Auger Truck	0.34	2.74	0.78	0.02	0.03	0.03
Total	1.11	9.18	4.06	0.03	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	39.2	0.0	39.2
Backhoe/Front Loader	35.3	0.0	35.3
Auger Truck	44.4	0.0	44.4
Total	118.9	0.0	119.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	96	8	1
Offsite				
1-Ton Crew Cab Flat Bed, 4x4	1	96	N/A	30
Dump Truck	1	96	N/A	30
Concrete Mixer Truck	3	65	N/A	30
Worker Commute	7	96	N/A	60

Table 38
115 kV Subtransmission Line Construction Emissions
Install Tubular Steel Pole Foundations

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.01	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Concrete Mixer Truck	0.07	0.39	0.84	0.00	0.04	0.03
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.31	2.14	1.43	0.01	0.11	0.08
Total	0.31	2.14	1.43	0.01	0.11	0.08

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.2	0.0	0.2
Onsite Total	0.2	0.0	0.2
Offsite			
1-Ton Crew Cab Flat Bed, 4x4	3.8	0.0	3.8
Dump Truck	5.5	0.0	5.5
Concrete Mixer Truck	11.1	0.0	11.1
Worker Commute	20.3	0.0	20.3
Offsite Total	40.7	0.0	40.7
Total	40.9	0.0	40.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	1	0.965	0.097	0.97	0.10
Onsite Total						0.97	0.10
Offsite							
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.38	0.00
Total						1.35	0.10

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	35	9.94E-04	2.07E-04	0.03	0.01
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.03	0.01

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.51	2.12	2.39	0.01	0.09	0.08	62.8
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	32.8
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	32.8
Total	0.70	3.43	3.10	0.02	0.41	0.12	95.6

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	128	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.51	2.12	2.39	0.01	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	62.7	0.0	62.8
Total	62.7	0.0	62.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	128	N/A	30
40' Flat Bed Pole Truck	1	128	N/A	30
Worker Commute	4	128	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
40' Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 39
115 kV Subtransmission Line Construction Emissions
Steel Pole Haul

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
40' Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	10.0	0.0	10.0
40' Flat Bed Pole Truck	7.3	0.0	7.3
Worker Commute	15.5	0.0	15.5
Offsite Total	32.8	0.0	32.8
Total	32.8	0.0	32.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
40' Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 40
115 kV Subtransmission Line Construction Emissions
Steel Pole Assembly

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.66	3.63	3.35	0.01	0.13	0.12	152.3
Offsite Motor Vehicle Exhaust	0.32	2.36	0.88	0.01	0.08	0.06	101.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.32	2.36	0.88	0.01	0.56	0.06	101.7
Total	0.98	5.99	4.23	0.02	0.69	0.18	254.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	1	255	5
Boom/Crane Truck	350	1	255	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.14	1.51	0.96	0.00	0.04	0.04
Boom/Crane Truck	0.51	2.12	2.39	0.01	0.09	0.08
Total	0.66	3.63	3.35	0.01	0.13	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	27.2	0.0	27.2
Boom/Crane Truck	125.0	0.0	125.1
Total	152.1	0.0	152.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	255	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	2	255	N/A	30
Worker Commute	8	255	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 41
115 kV Subtransmission Line Construction Emissions
Steel Pole Erection

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.21	1.65	0.14	0.01	0.05	0.03
Offsite Total	0.32	2.36	0.88	0.01	0.08	0.06
Total	0.32	2.36	0.88	0.01	0.08	0.06

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	20.0	0.0	20.0
1-Ton Crew Cab Flat Bed, 4x4	20.0	0.0	20.0
Worker Commute	61.7	0.0	61.7
Offsite Total	101.7	0.0	101.7
Total	101.7	0.0	101.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	8	Paved	60	0.001	0.000	0.38	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	4.34	23.98	22.32	0.13	0.72	0.66	458.5
Offsite Motor Vehicle Exhaust	0.73	5.39	2.11	0.02	0.20	0.14	83.2
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.15	0.00	
Offsite Total	0.73	5.39	2.11	0.02	1.36	0.14	83.2
Total	5.07	29.37	24.43	0.15	2.08	0.80	541.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	250	4	89	8
Boom/Crane Truck	350	2	89	8
Splicing Rig	350	1	20	2
3 Drum Straw Line Puller	300	1	45	6
Static Truck/Tensioner	350	1	45	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Splicing Rig	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
3 Drum Straw Line Puller	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	1.86	11.87	11.71	0.07	0.35	0.32
Boom/Crane Truck	1.37	5.66	6.36	0.03	0.23	0.21
Splicing Rig	0.16	0.92	0.61	0.00	0.02	0.02
3 Drum Straw Line Puller	0.48	2.76	1.82	0.01	0.06	0.05
Static Truck/Tensioner	0.48	2.76	1.82	0.01	0.06	0.05
Total	4.34	23.98	22.32	0.13	0.72	0.66

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	275.0	0.0	275.1
Boom/Crane Truck	116.3	0.0	116.4
Splicing Rig	4.6	0.0	4.6
3 Drum Straw Line Puller	31.1	0.0	31.2
Static Truck/Tensioner	31.1	0.0	31.2
Total	458.2	0.0	458.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	2	89	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	3	89	N/A	30
Wire Truck/Trailer	2	60	N/A	30
Dump Truck	1	89	N/A	30
Worker Commute	20	89	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.08	0.54	0.55	0.00	0.03	0.02
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Dump Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.52	4.11	0.35	0.01	0.12	0.08
Offsite Total	0.73	5.39	2.11	0.02	0.20	0.14
Total	0.73	5.39	2.11	0.02	0.20	0.14

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	7.0	0.0	7.0
1-Ton Crew Cab Flat Bed, 4x4	10.5	0.0	10.5
Wire Truck/Trailer	6.9	0.0	6.9
Dump Truck	5.1	0.0	5.1
Worker Commute	53.8	0.0	53.8
Offsite Total	83.2	0.0	83.2
Total	83.2	0.0	83.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 42
115 kV Subtransmission Line Construction Emissions
Wire Stringing

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
1-Ton Crew Cab Flat Bed, 4x4	3	Paved	30	0.001	0.000	0.07	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Dump Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	60	0.001	0.000	0.96	0.00
Offsite Total						1.15	0.00
Total						1.15	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.92	12.58	7.81	0.05	0.29	0.27	10.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.42	0.09	
Onsite Total	1.92	12.58	7.81	0.05	0.71	0.36	10.0
Offsite Motor Vehicle Exhaust	0.70	5.00	2.80	0.02	0.23	0.17	5.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.10	0.00	
Offsite Total	0.70	5.00	2.80	0.02	1.34	0.17	5.3
Total	2.63	17.58	10.62	0.07	2.05	0.52	15.3

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator	250	1	5	10
Crane (L)	500	1	5	10
Backhoe/Front Loader	125	1	5	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Excavator	250	0.065	0.321	0.222	0.002	0.007	0.007	158.683	0.006	Excavators
Crane (L)	500	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction= 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator	0.65	3.21	2.22	0.02	0.07	0.07
Crane (L)	0.86	3.54	3.98	0.02	0.15	0.13
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Total	1.92	12.58	7.81	0.05	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Excavator	3.6	0.0	3.6
Crane (L)	4.1	0.0	4.1
Backhoe/Front Loader	2.3	0.0	2.3
Total	10.0	0.0	10.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
1-Ton Crew Cab, 4x4	2	5	N/A	50
Water Truck	1	5	N/A	25
Concrete Mixer Truck	3	5	N/A	25
Dump Truck	3	5	N/A	25
Lowboy Truck/Trailer	1	5	N/A	25
Flat Bed Truck/Trailer	3	5	N/A	25
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

1-Ton Crew Cab, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Flat Bed Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Flat Bed Truck/Trailer	0.06	0.32	0.70	0.00	0.04	0.03
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.70	5.00	2.80	0.02	0.23	0.17
Total	0.70	5.00	2.80	0.02	0.23	0.17

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Crew Cab, 4x4	0.3	0.0	0.3
Water Truck	0.2	0.0	0.2
Concrete Mixer Truck	0.7	0.0	0.7
Dump Truck	0.7	0.0	0.7
Lowboy Truck/Trailer	0.2	0.0	0.2
Flat Bed Truck/Trailer	0.7	0.0	0.7
Worker Commute	2.5	0.0	2.5
Offsite Total	5.3	0.0	5.3
Total	5.3	0.0	5.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Flat Bed Truck/Trailer	3	Paved	25	0.001	0.000	0.06	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.10	0.00
Total						1.10	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	49.28	9.94E-04	2.07E-04	0.05	0.01

Table 42b
115 kV Subtransmission Line Construction Emissions
Vault Installation

Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.017	22.0	4.58	0.37	0.08
Total					0.42	0.09

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling volume based on a vault size of approximately 24 feet long, 14 feet wide, 12 feet deep. Approximately 0.33 vaults built per day. 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day 12 feet x 14 feet x 12 feet = 4032 cubic feet x 0.33 vaults/day = 1330.56 cubic feet/day = 49.28 cubic yards/day

Storage pile size based on a 1 vault volume of 4032 cubic feet of soil. Storage pile assumed maximum 48 feet long, 14 feet wide, 6 feet high. 48 feet x 14 feet = 720 square feet = 0.017 acres

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.71	8.86	3.54	0.02	0.16	0.15	10.1
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.73	0.15	
Onsite Total	0.71	8.86	3.54	0.02	0.89	0.30	10.1
Offsite Motor Vehicle Exhaust	0.68	4.89	2.57	0.02	0.22	0.16	7.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	1.08	0.00	
Offsite Total	0.68	4.89	2.57	0.02	1.31	0.16	7.5
Total	1.39	13.75	6.11	0.04	2.20	0.46	17.6

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe/Front Loader	125	1	15	10
Compressor Trailer	60	1	15	10

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe/Front Loader	0.42	5.84	1.61	0.01	0.07	0.07
Compressor Trailer	0.29	3.02	1.93	0.01	0.09	0.08
Total	0.71	8.86	3.54	0.02	0.16	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe/Front Loader	6.9	0.0	6.9
Compressor Trailer	3.2	0.0	3.2
Total	10.1	0.0	10.1

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
None				
Offsite				
Lowboy Truck/Trailer	1	15	N/A	25
1-Ton Truck, 4x4	2	15	N/A	50
Water Truck	1	15	N/A	25
Pipe Truck/Trailer	1	15	N/A	25
Concrete Mixer Truck	3	15	N/A	25
Dump Truck	3	15	N/A	25
Lowboy Truck/Trailer	1	1	N/A	25
Worker Commute	20	1	N/A	50

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None									
Offsite									
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Water Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Pipe Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Concrete Mixer Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 42c
115 kV Subtransmission Line Construction Emissions
Duct Bank Installation

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None						
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Water Truck	0.02	0.15	0.15	0.00	0.01	0.01
Pipe Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Concrete Mixer Truck	0.06	0.32	0.70	0.00	0.04	0.03
Dump Truck	0.06	0.32	0.70	0.00	0.04	0.03
Lowboy Truck/Trailer	0.02	0.11	0.23	0.00	0.01	0.01
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.68	4.89	2.57	0.02	0.22	0.16
Total	0.68	4.89	2.57	0.02	0.22	0.16

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None			
Onsite Total	0.0	0.0	0.0
Offsite			
Lowboy Truck/Trailer	0.7	0.0	0.7
1-Ton Truck, 4x4	0.8	0.0	0.8
Water Truck	0.5	0.0	0.5
Pipe Truck/Trailer	0.7	0.0	0.7
Concrete Mixer Truck	2.1	0.0	2.1
Dump Truck	2.1	0.0	2.1
Lowboy Truck/Trailer	0.0	0.0	0.0
Worker Commute	0.5	0.0	0.5
Offsite Total	7.5	0.0	7.5
Total	7.5	0.0	7.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Water Truck	1	Paved	25	0.001	0.000	0.02	0.00
Pipe Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Concrete Mixer Truck	3	Paved	25	0.001	0.000	0.06	0.00
Dump Truck	3	Paved	25	0.001	0.000	0.06	0.00
Lowboy Truck/Trailer	1	Paved	25	0.001	0.000	0.02	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						1.08	0.00
Total						1.08	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level ^c	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day	92.28	9.94E-04	2.07E-04	0.09	0.02
Bulldozing, Scraping and Grading	hr/day	0	0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres	0.029	22.0	4.58	0.64	0.13
Total					0.73	0.15

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Soil handling cubic yards/day based on approximately 250 feet of trenching per day, 24 inches wide x 60 inches deep. 83 yards x 0.867 yards x 1.667 yards = 92.28 cubic yards/day

Storage pile acres based on approximately 250 feet of trenching per day, 60 inches wide x 24 inches high. 83 yards x 1.667 yards = 138.361 square yards = 0.029 acres

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	2.99	15.06	12.75	0.08	0.44	0.40	90.9
Offsite Motor Vehicle Exhaust	0.53	4.03	0.88	0.01	0.14	0.09	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.93	0.00	
Offsite Total	0.53	4.03	0.88	0.01	1.06	0.09	3.3
Total	3.51	19.09	13.63	0.09	1.50	0.50	94.2

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Boom/Crane Truck	350	1	25	10
Manlift/Bucket Truck	250	1	25	10
Puller	350	1	25	10
Static Truck/Tensioner	350	1	25	10

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Manlift/Bucket Truck	250	0.054	0.232	0.271	0.001	0.009	0.009	112.159	0.005	Cranes
Puller	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment
Static Truck/Tensioner	350	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

^c From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

^d http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Boom/Crane Truck	0.86	3.54	3.98	0.02	0.15	0.13
Manlift/Bucket Truck	0.54	2.32	2.71	0.01	0.09	0.09
Puller	0.79	4.61	3.03	0.02	0.10	0.09
Static Truck/Tensioner	0.79	4.61	3.03	0.02	0.10	0.09
Total	2.99	15.06	12.75	0.08	0.44	0.40

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Boom/Crane Truck	20.4	0.0	20.4
Manlift/Bucket Truck	12.7	0.0	12.7
Puller	28.8	0.0	28.8
Static Truck/Tensioner	28.8	0.0	28.8
Total	90.8	0.0	90.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/ Veh.
Onsite				
None				
Offsite				
1-Ton Truck, 4x4	2	5	N/A	50
Wire Truck/Trailer	2	5	N/A	30
Worker Commute	20	5	N/A	50

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
1-Ton Truck, 4x4	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Wire Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						

Table 42d
115 kV Subtransmission Line Construction Emissions
Install Underground Cable

None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
1-Ton Truck, 4x4	0.04	0.34	0.03	0.00	0.01	0.01
Wire Truck/Trailer	0.05	0.26	0.56	0.00	0.03	0.02
Worker Commute	0.44	3.43	0.29	0.01	0.10	0.06
Offsite Total	0.53	4.03	0.88	0.01	0.14	0.09
Total	0.53	4.03	0.88	0.01	0.14	0.09

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
1-Ton Truck, 4x4	0.3	0.0	0.3
Wire Truck/Trailer	0.6	0.0	0.6
Worker Commute	2.5	0.0	2.5
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

^b Emission factors are in Table 54 and Table 55

^c CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None							
Onsite Total						0.00	0.00
Offsite							
1-Ton Truck, 4x4	2	Paved	50	0.001	0.000	0.08	0.00
Wire Truck/Trailer	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	20	Paved	50	0.001	0.000	0.80	0.00
Offsite Total						0.93	0.00
Total						0.93	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.27	7.94	6.96	0.03	0.27	0.25	23.3
Offsite Motor Vehicle Exhaust	0.24	1.72	0.75	0.01	0.07	0.05	5.7
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.36	0.00	
Offsite Total	0.24	1.72	0.75	0.01	0.43	0.05	5.7
Total	1.50	9.66	7.71	0.04	0.69	0.29	29.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Compressor Trailer	60	2	18	6
Boom/Crane Truck	350	1	18	8
Bucket Truck	250	1	18	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Compressor Trailer	60	0.029	0.302	0.193	0.001	0.009	0.008	46.950	0.003	Air Compressors
Boom/Crane Truck	350	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
Bucket Truck	250	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Compressor Trailer	0.35	3.63	2.31	0.01	0.11	0.10
Boom/Crane Truck	0.69	2.83	3.18	0.01	0.12	0.11
Bucket Truck	0.23	1.48	1.46	0.01	0.04	0.04
Total	1.27	7.94	6.96	0.03	0.27	0.25

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Compressor Trailer	4.6	0.0	4.6
Boom/Crane Truck	11.8	0.0	11.8
Bucket Truck	7.0	0.0	7.0
Total	23.3	0.0	23.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
3/4-Ton Truck, 4x4	1	18	N/A	30
1-Ton Crew Cab Flat Bed, 4x4	1	18	N/A	30
Extendable Flat Bed Pole Truck	1	18	N/A	30
Worker Commute	6	18	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 43
115 kV Subtransmission Line Construction Emissions
Guard Structure Removal

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
3/4-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
1-Ton Crew Cab Flat Bed, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Extendable Flat Bed Pole Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
3/4-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
1-Ton Crew Cab Flat Bed, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Extendable Flat Bed Pole Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.16	1.23	0.10	0.00	0.03	0.02
Offsite Total	0.24	1.72	0.75	0.01	0.07	0.05
Total	0.24	1.72	0.75	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
3/4-Ton Truck, 4x4	0.7	0.0	0.7
1-Ton Crew Cab Flat Bed, 4x4	0.7	0.0	0.7
Extendable Flat Bed Pole Truck	1.0	0.0	1.0
Worker Commute	3.3	0.0	3.3
Offsite Total	5.7	0.0	5.7
Total	5.7	0.0	5.7

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0						
Onsite Total						0.00	0.00
Offsite							
3/4-Ton Truck, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
1-Ton Crew Cab Flat Bed, 4x4	1	Paved	30	0.001	0.000	0.02	0.00
Extendable Flat Bed Pole Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	6	Paved	60	0.001	0.000	0.29	0.00
Offsite Total						0.36	0.00
Total						0.36	0.00

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.96	7.91	4.75	0.02	0.20	0.19	16.3
Onsite Motor Vehicle Exhaust	0.00	0.01	0.03	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	2.90	0.29	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.96	7.93	4.78	0.02	3.10	0.48	16.4
Offsite Motor Vehicle Exhaust	0.26	1.93	0.77	0.01	0.07	0.05	6.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.41	0.00	
Offsite Total	0.26	1.93	0.77	0.01	0.48	0.05	6.3
Total	1.22	9.85	5.55	0.03	3.58	0.53	22.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Road Grader	250	1	18	6
Backhoe/Front Loader	125	1	18	6
Drum Type Compactor	100	1	18	6

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Road Grader	250	0.078	0.355	0.365	0.002	0.013	0.012	172.113	0.007	Graders
Backhoe/Front Loader	125	0.042	0.584	0.161	0.001	0.007	0.007	101.387	0.004	Tractors/Loaders/Backhoes
Drum Type Compactor	100	0.039	0.380	0.265	0.001	0.014	0.013	58.989	0.004	Rollers

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Road Grader	0.47	2.13	2.19	0.01	0.08	0.07
Backhoe/Front Loader	0.25	3.50	0.97	0.01	0.04	0.04
Drum Type Compactor	0.24	2.28	1.59	0.00	0.08	0.08
Total	0.96	7.91	4.75	0.02	0.20	0.19

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Road Grader	8.4	0.0	8.4
Backhoe/Front Loader	5.0	0.0	5.0
Drum Type Compactor	2.9	0.0	2.9
Total	16.3	0.0	16.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh.
Onsite				
Water Truck	1	18	8	3
Offsite				
1-Ton Crew Cab, 4x4	2	18	N/A	30
Lowboy Truck/Trailer	1	18	N/A	30
Worker Commute	7	18	N/A	60

Table 44
115 kV Subtransmission Line Construction Emissions
Restoration

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Water Truck		8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
1-Ton Crew Cab, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Lowboy Truck/Trailer	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Water Truck	0.00	0.01	0.03	0.00	0.00	0.00
Onsite Total	0.00	0.01	0.03	0.00	0.00	0.00
Offsite						
1-Ton Crew Cab, 4x4	0.06	0.36	0.37	0.00	0.02	0.01
Lowboy Truck/Trailer	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.26	1.93	0.77	0.01	0.07	0.05
Total	0.26	1.94	0.80	0.01	0.07	0.05

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Water Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
1-Ton Crew Cab, 4x4	1.4	0.0	1.4
Lowboy Truck/Trailer	1.0	0.0	1.0
Worker Commute	3.8	0.0	3.8
Offsite Total	6.2	0.0	6.3
Total	6.4	0.0	6.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Water Truck	1	Unpaved	3	0.965	0.097	2.90	0.29
Onsite Total						2.90	0.29
Offsite							
1-Ton Crew Cab, 4x4	2	Paved	30	0.001	0.000	0.05	0.00
Lowboy Truck/Trailer	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.41	0.00
Total						3.30	0.29

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 45
Telecommunications Construction
Tower Foundation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.53	6.74	3.59	0.01	0.11	0.10	2.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.50	0.10	
Onsite Total	0.53	6.74	3.59	0.01	0.61	0.21	2.4
Offsite Motor Vehicle Exhaust	0.18	1.31	0.72	0.01	0.05	0.04	1.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.26	0.00	
Offsite Total	0.18	1.31	0.72	0.01	0.32	0.04	1.3
Total	0.71	8.05	4.31	0.02	0.93	0.25	3.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	5	8
Concrete Mixer	120	1	5	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Concrete Mixer	120	0.038	0.504	0.273	0.001	0.009	0.008	80.859	0.003	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Concrete Mixer	0.30	4.04	2.18	0.01	0.07	0.06
Total	0.53	6.74	3.59	0.01	0.11	0.10

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	0.9	0.0	0.9
Concrete Mixer	1.5	0.0	1.5
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	5	N/A	30
Stake Truck	1	5	N/A	30
Worker Commute	4	5	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

**Table 45
Telecommunications Construction
Tower Foundation**

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Stake Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Stake Truck	0.02	0.13	0.28	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.18	1.31	0.72	0.01	0.05	0.04
Total	0.18	1.31	0.72	0.01	0.05	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Stake Truck	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	1.3	0.0	1.3
Total	1.3	0.0	1.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Stake Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.26	0.00
Total						0.26	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	500	9.94E-04	2.07E-04	0.50	0.10
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.50	0.10

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Estimate

**Table 46
Telecommunications Construction
Tower Construction**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.83	4.64	4.38	0.02	0.17	0.15	23.8
Offsite Motor Vehicle Exhaust	0.16	1.18	0.44	0.00	0.04	0.03	6.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.24	0.00	
Offsite Total	0.16	1.18	0.44	0.00	0.28	0.03	6.0
Total	0.99	5.82	4.82	0.02	0.45	0.18	29.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Crane	300	1	30	8
150-Foot Lift Truck	100	1	30	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Crane	300	0.086	0.354	0.398	0.002	0.015	0.013	180.101	0.008	Cranes
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Crane	0.69	2.83	3.18	0.01	0.12	0.11
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.83	4.64	4.38	0.02	0.17	0.15

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Crane	19.6	0.0	19.6
150-Foot Lift Truck	4.1	0.0	4.1
Total	23.8	0.0	23.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	2	30	N/A	30
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

**Table 46
Telecommunications Construction
Tower Construction**

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.06	0.36	0.37	0.00	0.02	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.16	1.18	0.44	0.00	0.04	0.03
Total	0.16	1.18	0.44	0.00	0.04	0.03

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	2.4	0.0	2.4
Worker Commute	3.6	0.0	3.6
Offsite Total	6.0	0.0	6.0
Total	6.0	0.0	6.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.24	0.00
Total						0.24	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 47
Telecommunications Construction
Dish Installation**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.14	1.81	1.20	0.00	0.05	0.05	1.4
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	1.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	1.6
Total	0.27	2.81	1.45	0.01	0.30	0.07	3.0

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
150-Foot Lift Truck	100	1	10	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
150-Foot Lift Truck	100	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
150-Foot Lift Truck	0.14	1.81	1.20	0.00	0.05	0.05
Total	0.14	1.81	1.20	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
150-Foot Lift Truck	1.4	0.0	1.4
Total	1.4	0.0	1.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	10	N/A	30
Worker Commute	4	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 47
Telecommunications Construction
Dish Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	0.4	0.0	0.4
Worker Commute	1.2	0.0	1.2
Offsite Total	1.6	0.0	1.6
Total	1.6	0.0	1.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

**Table 48
Telecommunications Construction
Control Building**

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	19.3
Offsite Motor Vehicle Exhaust	0.08	0.59	0.22	0.00	0.02	0.01	2.5
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.12	0.00	
Offsite Total	0.08	0.59	0.22	0.00	0.14	0.01	2.5
Total	0.54	3.56	3.15	0.02	0.23	0.09	21.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	25	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	19.3	0.0	19.3
Total	19.3	0.0	19.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Crew Truck	1	25	N/A	30
Worker Commute	2	25	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Crew Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 48
Telecommunications Construction
Control Building

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Crew Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.59	0.22	0.00	0.02	0.01
Total	0.08	0.59	0.22	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Crew Truck	1.0	0.0	1.0
Worker Commute	1.5	0.0	1.5
Offsite Total	2.5	0.0	2.5
Total	2.5	0.0	2.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Crew Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.12	0.00
Total						0.12	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 49
Telecommunications Construction
Overhead Communications Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.46	2.97	2.93	0.02	0.09	0.08	24.0
Offsite Motor Vehicle Exhaust	0.13	1.00	0.25	0.00	0.03	0.02	5.0
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.22	0.00	
Offsite Total	0.13	1.00	0.25	0.00	0.25	0.02	5.0
Total	0.60	3.97	3.18	0.02	0.33	0.10	28.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Bucket Truck	350	1	31	8

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Bucket Truck	350	0.058	0.371	0.366	0.002	0.011	0.010	212.856	0.005	Aerial Lifts

a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Bucket Truck	0.46	2.97	2.93	0.02	0.09	0.08
Total	0.46	2.97	2.93	0.02	0.09	0.08

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Bucket Truck	23.9	0.0	24.0
Total	23.9	0.0	24.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Reel Truck	1	31	N/A	30
Worker Commute	4	31	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Reel Truck	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 49
Telecommunications Construction
Overhead Communications Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Reel Truck	0.03	0.18	0.18	0.00	0.01	0.01
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.13	1.00	0.25	0.00	0.03	0.02
Total	0.13	1.00	0.25	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Reel Truck	1.2	0.0	1.2
Worker Commute	3.7	0.0	3.8
Offsite Total	5.0	0.0	5.0
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Reel Truck	1	Paved	30	0.001	0.000	0.02	0.00
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.22	0.00
Total						0.22	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.08	0.62	0.05	0.00	0.02	0.01	0.9
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.14	0.00	
Offsite Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9
Total	0.08	0.62	0.05	0.00	0.16	0.01	0.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

a From Table 53

b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
None				0
Offsite				
Van	2	10	N/A	30
Worker Commute	2	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
None		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offsite									
Van	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

a From Table 54 or Table 55

Table 50
Telecommunications Construction
Substation Telecommunications Equipment Installation

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
None	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Van	0.03	0.21	0.02	0.00	0.01	0.00
Worker Commute	0.05	0.41	0.03	0.00	0.01	0.01
Offsite Total	0.08	0.62	0.05	0.00	0.02	0.01
Total	0.08	0.62	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
None	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Van	0.3	0.0	0.3
Worker Commute	0.6	0.0	0.6
Offsite Total	0.9	0.0	0.9
Total	0.9	0.0	0.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
None	0					0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Van	2	Paved	30	0.001	0.000	0.05	0.00
Worker Commute	2	Paved	60	0.001	0.000	0.10	0.00
Offsite Total						0.14	0.00
Total						0.14	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.32	1.84	1.21	0.01	0.04	0.04	13.8
Onsite Motor Vehicle Exhaust	0.03	0.21	0.22	0.00	0.01	0.01	1.4
Onsite Motor Vehicle Fugitive PM	--	--	--	--	15.93	1.59	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.35	2.05	1.43	0.01	15.98	1.64	15.2
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	3.6
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	3.6
Total	0.45	2.87	1.50	0.01	16.20	1.65	18.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
1-Ton Truck	300	1	30	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
1-Ton Truck	300	0.079	0.461	0.303	0.002	0.010	0.009	254.239	0.007	Other Construction Equipment

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
1-Ton Truck	0.32	1.84	1.21	0.01	0.04	0.04
Total	0.32	1.84	1.21	0.01	0.04	0.04

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
1-Ton Truck	13.8	0.0	13.8
Total	13.8	0.0	13.8

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateactionregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
1-Ton Truck, 4x4	3	30	4	10
Van	1	30	2	5
Offsite				
Worker Commute	4	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
1-Ton Truck, 4x4	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Van	Delivery	9.22E-04	5.95E-03	6.16E-03	2.76E-05	2.84E-04	2.10E-04	2.88E+00	3.76E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51
Telecommunications Construction
Santiago Peak Communication Site

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
1-Ton Truck, 4x4	0.03	0.18	0.18	0.00	0.01	0.01
Van	0.00	0.03	0.03	0.00	0.00	0.00
Onsite Total	0.03	0.21	0.22	0.00	0.01	0.01
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.14	1.03	0.28	0.00	0.03	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
1-Ton Truck, 4x4	1.2	0.0	1.2
Van	0.2	0.0	0.2
Onsite Total	1.4	0.0	1.4
Offsite			
Worker Commute	3.6	0.0	3.6
Offsite Total	3.6	0.0	3.6
Total	5.0	0.0	5.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
1-Ton Truck, 4x4	3	Unpaved	10	0.455	0.046	13.66	1.37
Van	1	Unpaved	5	0.455	0.046	2.28	0.23
Onsite Total						15.93	1.59
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						16.12	1.59

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Table 51b

Additional Substation Construction Emissions
Civil

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO ₂ e (MT)
Construction Equipment Exhaust	0.78	9.91	3.89	0.02	0.14	0.12	7.4
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	4.83	0.48	
Earthwork Fugitive PM	--	--	--	--	0.02	0.00	
Onsite Total	0.78	9.93	3.94	0.02	4.99	0.61	7.5
Offsite Motor Vehicle Exhaust	0.38	2.47	2.36	0.01	0.16	0.11	4.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.38	2.47	2.36	0.01	0.49	0.11	4.4
Total	1.16	12.41	6.30	0.03	5.48	0.73	11.9

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Excavator with Auger Attachment	152	1	10	8
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4
Forklift	83	1	10	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO ₂ (lb/hr) ^a	CH ₄ (lb/hr) ^a	Category
Excavator with Auger Attachment	152	0.052	0.664	0.198	0.001	0.009	0.008	112.222	0.005	Excavators
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders
Forklift	83	0.017	0.209	0.100	0.000	0.002	0.002	31.225	0.002	Forklifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction = 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006.

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Excavator with Auger Attachment	0.41	5.31	1.59	0.01	0.07	0.07
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Forklift	0.07	0.83	0.40	0.00	0.01	0.01
Total	0.78	9.91	3.89	0.02	0.14	0.12

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO ₂ (MT) ^a	CH ₄ (MT) ^a	CO ₂ e (MT) ^b
Excavator with Auger Attachment	4.1	0.0	4.1
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Forklift	0.0	0.0	0.0
Total	7.4	0.0	7.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	4	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO ₂ (lb/mi) ^a	CH ₄ (lb/mi) ^a
Onsite									

Table 51b

Additional Substation Construction Emissions

Civil

Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Offsite										
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05	
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05	

a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.19	1.03	2.24	0.01	0.12	0.09
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.38	2.47	2.36	0.01	0.16	0.11
Total	0.38	2.50	2.41	0.01	0.16	0.12

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	2.3	0.0	2.3
Worker Commute	2.1	0.0	2.1
Offsite Total	4.4	0.0	4.4
Total	4.5	0.0	4.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/ Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	0.965	0.097	2.41	0.24
Water Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Onsite Total						4.83	0.48
Offsite							
Concrete Truck	4	Paved	60	0.001	0.000	0.19	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						5.16	0.48

a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	24	9.94E-04	2.07E-04	0.02	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.02	0.00

a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated at 24 CY

Table 51c
Additional Substation Construction Emissions
Electrical

Emissions Summary							
Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	1.14	11.25	7.51	0.02	0.29	0.27	15.5
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.01	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	1.15	11.27	7.51	0.02	0.30	0.27	15.6
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	1.41	13.32	7.68	0.03	0.84	0.31	24.7

Construction Equipment Summary				
Equipment	Horse-power	Number	Days Used	Hours Used/Day
Manlift	43	4	30	7
Reach Manlift	87	2	30	6
15-Ton Crane	125	2	5	5

Construction Equipment Exhaust Emission Factors										
Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Scissor Lift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
15-Ton Crane	125	0.046	0.474	0.230	0.001	0.012	0.011	80.345	0.004	Cranes

^a From Table 53
^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction = 0.920
 From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006,
http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions						
Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Manlift	0.47	3.78	3.41	0.01	0.10	0.09
Reach Manlift	0.21	2.72	1.79	0.01	0.08	0.07
15-Ton Crane	0.46	4.74	2.30	0.01	0.12	0.11
Total	1.14	11.25	7.51	0.02	0.29	0.27

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions			
Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Manlift	7.5	0.0	7.5
Reach Manlift	6.2	0.0	6.2
15-Ton Crane	1.8	0.0	1.8
Total	15.5	0.0	15.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]
 Emission factors are in Table 53
^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage				
Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	10	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Table 51c
Additional Substation Construction Emissions
Electrical

Motor Vehicle Exhaust Emission Factors									
Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.08	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.2	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	10	Paved	0.625	0.001	0.000	0.01	0.00
Onsite Total						0.01	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.49	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51d

Additional Substation Construction Emissions
Wiring

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.17	1.90	1.38	0.00	0.05	0.05	3.6
Onsite Motor Vehicle Exhaust	0.00	0.02	0.00	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.17	1.92	1.39	0.00	0.06	0.05	3.7
Offsite Motor Vehicle Exhaust	0.26	2.06	0.17	0.01	0.06	0.04	9.1
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.48	0.00	
Offsite Total	0.26	2.06	0.17	0.01	0.54	0.04	9.1
Total	0.44	3.97	1.56	0.01	0.59	0.09	12.8

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Reach Manlift	87	2	30	3
Manlift	43	1	15	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Reach Manlift	87	0.018	0.226	0.150	0.000	0.006	0.006	38.072	0.002	Aerial Lifts
Manlift	43	0.017	0.135	0.122	0.000	0.003	0.003	19.613	0.002	Aerial Lifts

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

<http://www.aqmd.gov/ceqa/handbook/PM2.5/PM2.5.html>

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Reach Manlift	0.11	1.36	0.90	0.00	0.04	0.03
Manlift	0.07	0.54	0.49	0.00	0.01	0.01
Total	0.17	1.90	1.38	0.00	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Reach Manlift	3.1	0.0	3.1
Manlift	0.5	0.0	0.5
Total	3.6	0.0	3.6

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	8	30	0.25	0.625
Offsite				
Worker Commute	10	30	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51d
Additional Substation Construction Emissions
Wiring

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.02	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.26	2.06	0.17	0.01	0.06	0.04
Offsite Total	0.26	2.06	0.17	0.01	0.06	0.04
Total	0.26	2.07	0.17	0.01	0.06	0.04

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.1	0.0	0.1
Onsite Total	0.1	0.0	0.1
Offsite			
Worker Commute	9.1	0.0	9.1
Offsite Total	9.1	0.0	9.1
Total	9.1	0.0	9.2

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climate registry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	8	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	10	Paved	60	0.001	0.000	0.48	0.00
Offsite Total						0.48	0.00
Total						0.48	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51e

Additional Substation Construction Emissions

Testing

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Onsite Motor Vehicle Fugitive PM	--	--	--	--	0.00	0.00	
Earthwork Fugitive PM	--	--	--	--	0.00	0.00	
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Offsite Motor Vehicle Exhaust	0.10	0.82	0.07	0.00	0.02	0.02	2.4
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.19	0.00	
Offsite Total	0.10	0.82	0.07	0.00	0.22	0.02	2.4
Total	0.11	0.83	0.07	0.00	0.22	0.02	2.4

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
None				

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
None										

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
None	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
None	0.0	0.0	0.0
Total	0.0	0.0	0.0

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Crew Truck	2	20	0.25	0.625
Offsite				
Worker Commute	4	20	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Crew Truck	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Offsite									
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Table 51e
Additional Substation Construction Emissions
Testing

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions						
Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Crew Truck	0.00	0.00	0.00	0.00	0.00	0.00
Onsite Total	0.00	0.00	0.00	0.00	0.00	0.00
Offsite						
Worker Commute	0.10	0.82	0.07	0.00	0.02	0.02
Offsite Total	0.10	0.82	0.07	0.00	0.02	0.02
Total	0.11	0.83	0.07	0.00	0.02	0.02

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions			
Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Crew Truck	0.0	0.0	0.0
Onsite Total	0.0	0.0	0.0
Offsite			
Worker Commute	2.4	0.0	2.4
Offsite Total	2.4	0.0	2.4
Total	2.4	0.0	2.4

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions							
Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Crew Truck	2	Paved	0.625	0.001	0.000	0.00	0.00
Onsite Total						0.00	0.00
Offsite							
Worker Commute	4	Paved	60	0.001	0.000	0.19	0.00
Offsite Total						0.19	0.00
Total						0.19	0.00

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions						
Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling	CY/day		9.94E-04	2.07E-04	0.00	0.00
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.00	0.00

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Table 51f

Additional Substation Construction Emissions
Civil - Demo

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT)
Construction Equipment Exhaust	0.29	3.77	1.90	0.01	0.05	0.05	3.3
Onsite Motor Vehicle Exhaust	0.00	0.02	0.05	0.00	0.00	0.00	0.1
Onsite Motor Vehicle Fugitive PM	--	--	--	--	4.83	0.48	
Earthwork Fugitive PM	--	--	--	--	0.14	0.03	
Onsite Total	0.30	3.79	1.95	0.01	5.02	0.56	3.4
Offsite Motor Vehicle Exhaust	0.28	1.96	1.24	0.01	0.10	0.07	3.3
Offsite Motor Vehicle Fugitive PM	--	--	--	--	0.34	0.00	
Offsite Total	0.28	1.96	1.24	0.01	0.44	0.07	3.3
Total	0.58	5.75	3.19	0.02	5.46	0.63	6.7

Construction Equipment Summary

Equipment	Horse-power	Number	Days Used	Hours Used/Day
Backhoe	79	1	10	8
Bobcat Skid Steer	75	1	10	4

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Backhoe	79	0.028	0.338	0.176	0.001	0.006	0.005	51.728	0.003	Tractors/Loaders/Backhoes
Bobcat Skid Steer	75	0.017	0.267	0.124	0.001	0.002	0.002	42.762	0.002	Skid Steer Loaders

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction= 0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Construction Equipment Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Backhoe	0.22	2.70	1.41	0.00	0.04	0.04
Bobcat Skid Steer	0.07	1.07	0.50	0.00	0.01	0.01
Total	0.29	3.77	1.90	0.01	0.05	0.05

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Construction Equipment Total Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Backhoe	1.9	0.0	1.9
Bobcat Skid Steer	1.5	0.0	1.5
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number ^b	Days Used	Hours Used/Day	Miles/Day/Veh. ^a
Onsite				
Dump Truck	2	5	0.5	1.25
Water Truck	1	10	1	2.5
Offsite				
Concrete Truck	2	5	N/A	60
Worker Commute	7	10	N/A	60

^a Onsite travel based on 25% use at 10 mph average speed

^b Concrete trucks based on 15,000 CY over 90 days and 10 CY/truck = 15,000 / 90 / 10 = 16.6

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Onsite									
Dump Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Water Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Offsite									
Concrete Truck	HHDT	8.02E-04	4.31E-03	9.33E-03	4.02E-05	4.85E-04	3.63E-04	4.20E+00	3.70E-05
Worker Commute	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Table 51f
Additional Substation Construction Emissions
Civil - Demo

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Onsite						
Dump Truck	0.00	0.01	0.02	0.00	0.00	0.00
Water Truck	0.00	0.01	0.02	0.00	0.00	0.00
Onsite Total	0.00	0.02	0.05	0.00	0.00	0.00
Offsite						
Concrete Truck	0.10	0.52	1.12	0.00	0.06	0.04
Worker Commute	0.18	1.44	0.12	0.00	0.04	0.03
Offsite Total	0.28	1.96	1.24	0.01	0.10	0.07
Total	0.28	1.98	1.29	0.01	0.10	0.07

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Total Greenhouse Gas Emissions

Vehicle	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Onsite			
Dump Truck	0.0	0.0	0.0
Water Truck	0.0	0.0	0.0
Onsite Total	0.1	0.0	0.1
Offsite			
Concrete Truck	1.1	0.0	1.1
Worker Commute	2.1	0.0	2.1
Offsite Total	3.3	0.0	3.3
Total	3.3	0.0	3.3

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Onsite							
Dump Truck	2	Unpaved	1.25	0.965	0.097	2.41	0.24
Water Truck	1	Unpaved	2.5	0.965	0.097	2.41	0.24
Onsite Total						4.83	0.48
Offsite							
Concrete Truck	2	Paved	60	0.001	0.000	0.10	0.00
Worker Commute	7	Paved	60	0.001	0.000	0.34	0.00
Offsite Total						0.34	0.00
Total						5.16	0.48

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Earthwork Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM10 Emission Factor ^a	PM2.5 Emission Factor ^a	PM10 (lb/day) ^b	PM2.5 (lb/day) ^b
Soil Handling ^c	CY/day	140	9.94E-04	2.07E-04	0.14	0.03
Bulldozing, Scraping and Grading	hr/day		0.348	0.072	0.00	0.00
Storage Pile Wind Erosion	acres		22.0	4.58	0.00	0.00
Total					0.14	0.03

^a From Table 57

^b Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

^c Peak daily estimated from total of 12,000 CY over 90 days

Table 52
Operational Emissions

Emissions Summary

Source	VOC (lb/day)	CO (lb/day)	NOX (lb/day)	SOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2e (MT/yr)
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00	8
Motor Vehicle Exhaust	0.08	0.64	0.05	0.00	0.02	0.01	2
Motor Vehicle Fugitive PM	--	--	--	--	2.42	0.23	--
SF6 Leakage	--	--	--	--	--	--	660
Total	0.17	1.22	0.62	0.01	2.46	0.24	670

Emergency Diesel Generator Usage

Equipment	Horse-power	Number	Days Used/Year	Hours Used/Day
Emergency Diesel Generator	440	1	52	1

Construction Equipment Exhaust Emission Factors

Equipment	Horse-power	VOC (lb/hr) ^a	CO (lb/hr) ^a	NOX (lb/hr) ^a	SOX (lb/hr) ^a	PM10 (lb/hr) ^a	PM2.5 (lb/hr) ^b	CO2 (lb/hr) ^a	CH4 (lb/hr) ^a	Category
Emergency Diesel Generator	440	0.086	0.582	0.570	0.003	0.017	0.000	336.853	0.008	Generator Sets

^a From Table 53

^b Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction=

0.920

From Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5

and PM 2.5 Significance Thresholds, SCAQMD, October 2006,

http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Emergency Diesel Generator Daily Criteria Pollutant Exhaust Emissions

Equipment	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Emergency Diesel Generator	0.09	0.58	0.57	0.00	0.02	0.00
Total	0.09	0.58	0.57	0.00	0.02	0.00

^a Emissions [lb/day] = number x hours/day x emission factor [lb/hr]

Emergency Diesel Generator Annual Greenhouse Gas Emissions

Equipment	CO2 (MT) ^a	CH4 (MT) ^a	CO2e (MT) ^b
Emergency Diesel Generator	7.9	0.0	7.9
Total	7.9	0.0	7.9

^a Emissions [metric tons, MT] = emission factor [lb/hr] x hours/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 53

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Motor Vehicle Usage

Vehicle	Number	Days Used/Year	Miles/Day/Veh.
Transmission Line Inspection	1	1	65
Subtransmission Line Inspection	1	1	62
Substation Site Visit	1	48	60

Motor Vehicle Exhaust Emission Factors

Vehicle	Category	VOC (lb/mi) ^a	CO (lb/mi) ^a	NOX (lb/mi) ^a	SOX (lb/mi) ^a	PM10 (lb/mi) ^a	PM2.5 (lb/mi) ^b	CO2 (lb/mi) ^a	CH4 (lb/mi) ^a
Transmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Subtransmission Line Inspection	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05
Substation Site Visit	Passenger	4.35E-04	3.43E-03	2.88E-04	1.07E-05	9.68E-05	6.42E-05	1.11E+00	3.64E-05

^a From Table 54 or Table 55

Motor Vehicle Daily Criteria Pollutant Exhaust Emissions

Vehicle	VOC (lb/day) ^a	CO (lb/day) ^a	NOX (lb/day) ^a	SOX (lb/day) ^a	PM10 (lb/day) ^a	PM2.5 (lb/day) ^a
Transmission Line Inspection	0.03	0.22	0.02	0.00	0.01	0.00
Subtransmission Line Inspection	0.03	0.21	0.02	0.00	0.01	0.00
Substation Site Visit	0.03	0.21	0.02	0.00	0.01	0.00
Total	0.08	0.64	0.05	0.00	0.02	0.01

^a Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

Motor Vehicle Annual Greenhouse Gas Emissions

Vehicle	CO2 (MT/yr) ^a	CH4 (MT/yr) ^a	CO2e (MT/yr) ^b
Transmission Line Inspection	0.0	0.0	0.0
Subtransmission Line Inspection	0.0	0.0	0.0
Substation Site Visit	1.5	0.0	1.5
Total	1.5	0.0	1.5

^a Emissions [metric tons, MT] = emission factor [lb/hr] x miles/day x Number x

days used x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 54 and Table 55

^b CO₂-equivalent (CO₂e) emission factors are CO₂ emissions plus 21 x CH₄ emissions, based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0, April 2008, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

Table 52
Operational Emissions

Motor Vehicle Fugitive Particulate Matter Emissions

Vehicle	Number	Road Type	Miles/Day/Vehicle	PM10 Emission Factor (lb/mi) ^a	PM2.5 Emission Factor (lb/mi) ^a	PM10 Emissions (lb/day) ^b	PM2.5 Emissions (lb/day) ^b
Transmission Line Inspection	1	Paved	60	0.001	0.000	0.05	0.00
Transmission Line Inspection	1	Unpaved	5	0.455	0.046	2.28	0.23
Subtransmission Line Inspection	1	Paved	62	0.001	0.000	0.05	0.00
Substation Site Visit	1	Paved	60	0.001	0.000	0.05	0.00
Total						2.42	0.23

^a From Table 56

^b Emissions [lb/day] = number x miles/day x emission factor [lb/mi]

SF6 Leakage Greenhouse Gas Emissions

Item	Value	Units
SF6 in 500 kV Equipment	11,515	pounds
SF6 in 115 kV Equipment	1,257	pounds
Total SF6 Added	12,772	pounds
SF6 Leakage Rate	0.5	%/year
SF6 Emissions	63.86	pounds
SF6 Global Warming Potential ^a	22,800	
CO2e Emissions^b	660	MT/yr

^a Based on Table C.1 from California Climate Action

Registry General Reporting Protocol, Version 3.0,

April 2008.

http://www.climateaction.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

^b CO₂e emissions [metric tons] = SF₆ emissions [lb] x

Global warming potential [lb CO₂e/lb SF₆] x 453.6 [g/lb] /

1,000,000 [g/MT]

Substation	Item	SF6 Volume (Pounds Each)	Quantity Added	Total SF6 Volume (Pounds)
500 kV				
Alberhill	Circuit Breaker	1,645	7	11,515
500 kV Total				11,515
115 kV				
Alberhill	Circuit Breaker	83	15	1,245
Valley	Circuit Breaker	71	(1)	(71)
Newcomb	Circuit Breaker	83	1	83
115 kV Total				1,257
Total Change				12,772

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin	SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
				COG	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	Aerial Lifts	Aerial Lifts0000	0.0101	0.0528	0.0831	0.0001	0.0025	8.7	0.0009
	25	Aerial Lifts	Aerial Lifts0016	0.0132	0.0451	0.0838	0.0001	0.0032	11.0	0.0012
	50	Aerial Lifts	Aerial Lifts0026	0.0168	0.1351	0.1218	0.0003	0.0035	19.6	0.0015
	120	Aerial Lifts	Aerial Lifts0051	0.0176	0.2265	0.1496	0.0004	0.0063	38.1	0.0016
	500	Aerial Lifts	Aerial Lifts0121	0.0580	0.3710	0.3660	0.0021	0.0109	213	0.0052
	750	Aerial Lifts	Aerial Lifts0501	0.1054	0.6706	0.6753	0.0039	0.0199	385	0.0095
Aerial Lifts Composite		Aerial Lifts	Aerial Lifts0751	0.0184	0.1646	0.1366	0.0004	0.0048	34.7	0.0017
Air Compressors	15	Air Compressors	Air Compressors0000	0.0087	0.0444	0.0545	0.0001	0.0023	7.2	0.0008
	25	Air Compressors	Air Compressors0016	0.0181	0.0605	0.1121	0.0002	0.0045	14.4	0.0016
	50	Air Compressors	Air Compressors0026	0.0263	0.1911	0.1476	0.0003	0.0047	22.3	0.0024
	120	Air Compressors	Air Compressors0051	0.0289	0.3023	0.1928	0.0006	0.0088	47.0	0.0026
	175	Air Compressors	Air Compressors0121	0.0424	0.4998	0.2187	0.0010	0.0104	88.5	0.0038
	250	Air Compressors	Air Compressors0176	0.0514	0.2531	0.2553	0.0015	0.0078	131	0.0046
	500	Air Compressors	Air Compressors0251	0.0894	0.4292	0.4150	0.0023	0.0134	232	0.0081
	750	Air Compressors	Air Compressors0501	0.1385	0.6633	0.6545	0.0036	0.0210	358	0.0125
	1000	Air Compressors	Air Compressors0751	0.1999	0.9265	2.5439	0.0049	0.0483	486	0.0180
	Air Compressors Composite		Air Compressors	Air Compressors1001	0.0349	0.3027	0.2104	0.0007	0.0088	63.6
Bore/Drill Rigs	15	Bore/Drill Rigs	Bore/Drill Rigs0000	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	25	Bore/Drill Rigs	Bore/Drill Rigs0016	0.0193	0.0658	0.1219	0.0002	0.0046	16.0	0.0017
	50	Bore/Drill Rigs	Bore/Drill Rigs0026	0.0190	0.2200	0.1662	0.0004	0.0009	31.0	0.0017
	120	Bore/Drill Rigs	Bore/Drill Rigs0051	0.0252	0.4660	0.1955	0.0009	0.0020	77.1	0.0023
	175	Bore/Drill Rigs	Bore/Drill Rigs0121	0.0324	0.7542	0.0787	0.0016	0.0030	141	0.0029
	250	Bore/Drill Rigs	Bore/Drill Rigs0176	0.0427	0.3426	0.0981	0.0021	0.0035	188	0.0039
	500	Bore/Drill Rigs	Bore/Drill Rigs0251	0.0706	0.6512	0.1622	0.0031	0.0058	311	0.0064
	750	Bore/Drill Rigs	Bore/Drill Rigs0501	0.1396	1.0891	0.3204	0.0062	0.0115	615	0.0126
	1000	Bore/Drill Rigs	Bore/Drill Rigs0751	0.2115	1.6437	3.8912	0.0093	0.0364	928	0.0191
Bore/Drill Rigs Composite		Bore/Drill Rigs	Bore/Drill Rigs1001	0.0428	0.5007	0.2864	0.0017	0.0042	165	0.0039
Cement and Mortar Mixers	15	Cement and Mortar Mixers	Cement and Mortar Mixers0000	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	Cement and Mortar Mixers	Cement and Mortar Mixers0016	0.0213	0.0724	0.1346	0.0002	0.0052	17.6	0.0019
Cement and Mortar Mixers Composite		Cement and Mortar Mixers	Cement and Mortar Mixers0026	0.0085	0.0414	0.0534	0.0001	0.0021	7.2	0.0008
Concrete/Industrial Saws	25	Concrete/Industrial Saws	Concrete/Industrial Saws0000	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018
	50	Concrete/Industrial Saws	Concrete/Industrial Saws0026	0.0279	0.2284	0.1910	0.0004	0.0053	30.2	0.0025
	120	Concrete/Industrial Saws	Concrete/Industrial Saws0051	0.0370	0.4561	0.2840	0.0009	0.0117	74.1	0.0033
	175	Concrete/Industrial Saws	Concrete/Industrial Saws0121	0.0623	0.8663	0.3523	0.0018	0.0160	160	0.0056
Concrete/Industrial Saws Composite		Concrete/Industrial Saws	Concrete/Industrial Saws0176	0.0337	0.3706	0.2471	0.0007	0.0093	58.5	0.0030
Cranes	50	Cranes	Cranes0000	0.0350	0.2256	0.1644	0.0003	0.0062	23.2	0.0032
	120	Cranes	Cranes0051	0.0376	0.3384	0.2298	0.0006	0.0120	50.1	0.0034
	175	Cranes	Cranes0121	0.0462	0.4744	0.2300	0.0009	0.0120	80.3	0.0042
	250	Cranes	Cranes0176	0.0544	0.2316	0.2705	0.0013	0.0094	112	0.0049
	500	Cranes	Cranes0251	0.0858	0.3535	0.3977	0.0018	0.0146	180	0.0077
	750	Cranes	Cranes0501	0.1446	0.5947	0.6821	0.0030	0.0248	303	0.0130
	9999	Cranes	Cranes0751	0.5219	1.9715	5.5760	0.0098	0.1146	971	0.0471
Cranes Composite		Cranes	Cranes1000	0.0681	0.3738	0.4223	0.0014	0.0143	129	0.0061
Crawler Tractors	50	Crawler Tractors	Crawler Tractors0000	0.0487	0.2566	0.1842	0.0003	0.0090	24.9	0.0044
	120	Crawler Tractors	Crawler Tractors0051	0.0609	0.4537	0.3562	0.0008	0.0221	65.8	0.0055
	175	Crawler Tractors	Crawler Tractors0121	0.0823	0.7265	0.4447	0.0014	0.0241	121	0.0074
	250	Crawler Tractors	Crawler Tractors0176	0.0924	0.3662	0.5348	0.0019	0.0192	166	0.0083
	500	Crawler Tractors	Crawler Tractors0251	0.1392	0.5877	0.7527	0.0025	0.0280	259	0.0126
	750	Crawler Tractors	Crawler Tractors0501	0.2506	1.0528	1.3878	0.0047	0.0510	465	0.0226
	1000	Crawler Tractors	Crawler Tractors0751	0.3749	1.5618	4.2168	0.0066	0.0656	658	0.0338
Crawler Tractors Composite		Crawler Tractors	Crawler Tractors1001	0.0789	0.5065	0.4482	0.0013	0.0227	114	0.0071

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025										
Air Basin		SC								
Equipment	MaxHP			ROG	CO	NOx	SOx	PM	CO2	CH4
Crushing/Proc. Equipment	50	Crushing/Proc. Equipment	Crushing/Proc. Equipment000	0.0508	0.3859	0.2899	0.0006	0.0083	44.0	0.0046
	120	Crushing/Proc. Equipment	Crushing/Proc. Equipment0051	0.0506	0.5406	0.3289	0.0010	0.0140	83.1	0.0046
	175	Crushing/Proc. Equipment	Crushing/Proc. Equipment0121	0.0795	0.9556	0.3830	0.0019	0.0177	167	0.0072
	250	Crushing/Proc. Equipment	Crushing/Proc. Equipment0176	0.0967	0.4768	0.4357	0.0028	0.0134	245	0.0087
	500	Crushing/Proc. Equipment	Crushing/Proc. Equipment0251	0.1459	0.6977	0.6163	0.0037	0.0200	374	0.0132
	750	Crushing/Proc. Equipment	Crushing/Proc. Equipment0501	0.2307	1.1003	0.9907	0.0059	0.0316	589	0.0208
	9999	Crushing/Proc. Equipment	Crushing/Proc. Equipment0751	0.6019	2.5014	6.6977	0.0131	0.1238	1,308	0.0543
Crushing/Proc. Equipment Composite		Crushing/Proc. Equipment	Crushing/Proc. Equipment10000	0.0693	0.6187	0.3763	0.0015	0.0146	132	0.0062
Dumpers/Tenders	25	Dumpers/Tenders	Dumpers/Tenders0000	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Dumpers/Tenders Composite		Dumpers/Tenders	Dumpers/Tenders0026	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Excavators	25	Excavators	Excavators0000	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018
	50	Excavators	Excavators0026	0.0297	0.2365	0.1616	0.0003	0.0035	25.0	0.0027
	120	Excavators	Excavators0051	0.0448	0.4942	0.2638	0.0009	0.0092	73.6	0.0040
	175	Excavators	Excavators0121	0.0518	0.6636	0.1982	0.0013	0.0091	112	0.0047
	250	Excavators	Excavators0176	0.0647	0.3210	0.2222	0.0018	0.0074	159	0.0058
	500	Excavators	Excavators0251	0.0946	0.4495	0.3091	0.0023	0.0107	234	0.0085
	750	Excavators	Excavators0501	0.1569	0.7451	0.5194	0.0039	0.0178	387	0.0142
Excavators Composite		Excavators	Excavators0056	0.0559	0.5086	0.2269	0.0013	0.0086	120	0.0050
Forklifts	50	Forklifts	Forklifts0000	0.0150	0.1361	0.0904	0.0002	0.0013	14.7	0.0014
	120	Forklifts	Forklifts0051	0.0168	0.2086	0.0997	0.0004	0.0023	31.2	0.0015
	175	Forklifts	Forklifts0121	0.0228	0.3310	0.0732	0.0006	0.0029	56.1	0.0021
	250	Forklifts	Forklifts0176	0.0289	0.1551	0.0746	0.0009	0.0027	77.1	0.0026
	500	Forklifts	Forklifts0251	0.0416	0.2123	0.1038	0.0011	0.0038	111	0.0038
Forklifts Composite		Forklifts	Forklifts0501	0.0236	0.2148	0.0860	0.0006	0.0025	54.4	0.0021
Generator Sets	15	Generator Sets	Generator Sets0000	0.0109	0.0627	0.0768	0.0002	0.0032	10.2	0.0010
	25	Generator Sets	Generator Sets0016	0.0216	0.0738	0.1368	0.0002	0.0055	17.6	0.0019
	50	Generator Sets	Generator Sets0026	0.0242	0.2034	0.1881	0.0004	0.0051	30.6	0.0022
	120	Generator Sets	Generator Sets0051	0.0340	0.4585	0.3022	0.0009	0.0122	77.9	0.0031
	175	Generator Sets	Generator Sets0121	0.0469	0.7328	0.3291	0.0016	0.0136	142	0.0042
	250	Generator Sets	Generator Sets0176	0.0558	0.3746	0.3885	0.0024	0.0106	213	0.0050
	500	Generator Sets	Generator Sets0251	0.0862	0.5820	0.5697	0.0033	0.0167	337	0.0078
	750	Generator Sets	Generator Sets0501	0.1401	0.9395	0.9382	0.0055	0.0272	544	0.0126
	9999	Generator Sets	Generator Sets0751	0.3235	1.8648	5.2188	0.0105	0.0888	1,049	0.0292
Generator Sets Composite		Generator Sets	Generator Sets10000	0.0288	0.2667	0.2329	0.0007	0.0081	61.0	0.0026
Graders	50	Graders	Graders0000	0.0382	0.2599	0.1877	0.0004	0.0063	27.5	0.0034
	120	Graders	Graders0051	0.0521	0.5009	0.3219	0.0009	0.0153	75.0	0.0047
	175	Graders	Graders0121	0.0652	0.7261	0.3117	0.0014	0.0157	124	0.0059
	250	Graders	Graders0176	0.0781	0.3549	0.3652	0.0019	0.0129	172	0.0071
	500	Graders	Graders0251	0.1023	0.4610	0.4468	0.0023	0.0165	229	0.0092
	750	Graders	Graders0501	0.2167	0.9755	0.9628	0.0049	0.0353	486	0.0196
Graders Composite		Graders	Graders0751	0.0676	0.5696	0.3314	0.0015	0.0147	133	0.0061
Off-Highway Tractors	120	Off-Highway Tractors	Off-Highway Tractors0000	0.1108	0.6619	0.6362	0.0011	0.0455	93.7	0.0100
	175	Off-Highway Tractors	Off-Highway Tractors0121	0.1110	0.7932	0.6639	0.0015	0.0370	130	0.0100
	250	Off-Highway Tractors	Off-Highway Tractors0176	0.0890	0.3179	0.5983	0.0015	0.0227	130	0.0090
	750	Off-Highway Tractors	Off-Highway Tractors0251	0.3692	1.5358	2.4157	0.0057	0.0618	568	0.0333
	1000	Off-Highway Tractors	Off-Highway Tractors0751	0.5623	2.3619	6.0896	0.0082	0.1577	814	0.0507
Off-Highway Tractors Composite		Off-Highway Tractors	Off-Highway Tractors1001	0.1134	0.6101	0.7291	0.0017	0.0331	151	0.0102
Off-Highway Trucks	175	Off-Highway Trucks	Off-Highway Trucks0000	0.0622	0.7536	0.2376	0.0014	0.0112	125	0.0056
	250	Off-Highway Trucks	Off-Highway Trucks0176	0.0730	0.3435	0.2521	0.0019	0.0085	167	0.0066
	500	Off-Highway Trucks	Off-Highway Trucks0251	0.1183	0.5319	0.3878	0.0027	0.0135	272	0.0107
	750	Off-Highway Trucks	Off-Highway Trucks0501	0.1921	0.8627	0.6384	0.0044	0.0221	442	0.0173
	1000	Off-Highway Trucks	Off-Highway Trucks0751	0.2823	1.2403	3.1782	0.0063	0.0546	625	0.0255
Off-Highway Trucks Composite		Off-Highway Trucks	Off-Highway Trucks1001	0.1140	0.5385	0.4769	0.0027	0.0142	260	0.0103

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025											
Air Basin		SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
				COG	CO	NOX	SOX	PM	CO2	CH4	
Other Construction Equipment	15	Other Construction Equipment	Other Construction Equipment000	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	
	25	Other Construction Equipment	Other Construction Equipment0016	0.0159	0.0544	0.1008	0.0002	0.0038	13.2	0.0014	
	50	Other Construction Equipment	Other Construction Equipment0026	0.0244	0.2188	0.1893	0.0004	0.0034	28.0	0.0022	
	120	Other Construction Equipment	Other Construction Equipment0051	0.0379	0.5045	0.2730	0.0009	0.0087	80.9	0.0034	
	175	Other Construction Equipment	Other Construction Equipment0121	0.0384	0.5858	0.1729	0.0012	0.0075	107	0.0035	
500	Other Construction Equipment	Other Construction Equipment0176	0.0792	0.4606	0.3034	0.0025	0.0099	254	0.0071		
Other Construction Equipment Composite				0.0442	0.3474	0.2021	0.0013	0.0069	123	0.0040	
Other General Industrial Equipmen	15	Other General Industrial Equipmen	Other General Industrial Equipmen0000	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006	
	25	Other General Industrial Equipmen	Other General Industrial Equipmen0016	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017	
	50	Other General Industrial Equipmen	Other General Industrial Equipmen0026	0.0298	0.2099	0.1491	0.0003	0.0047	21.7	0.0027	
	120	Other General Industrial Equipmen	Other General Industrial Equipmen0051	0.0436	0.4189	0.2803	0.0007	0.0120	62.0	0.0039	
	175	Other General Industrial Equipmen	Other General Industrial Equipmen0121	0.0519	0.5684	0.2412	0.0011	0.0115	95.9	0.0047	
	250	Other General Industrial Equipmen	Other General Industrial Equipmen0176	0.0608	0.2743	0.2679	0.0015	0.0083	136	0.0055	
	500	Other General Industrial Equipmen	Other General Industrial Equipmen0251	0.1174	0.5103	0.4826	0.0026	0.0157	265	0.0106	
	750	Other General Industrial Equipmen	Other General Industrial Equipmen0501	0.1939	0.8411	0.8117	0.0044	0.0262	437	0.0175	
	1000	Other General Industrial Equipmen	Other General Industrial Equipmen0751	0.2627	1.1060	2.9924	0.0056	0.0579	560	0.0237	
	Other General Industrial Equipmen Composite				0.0747	0.4438	0.3947	0.0016	0.0130	152	0.0067
Other Material Handling Equipment	50	Other Material Handling Equipment	Other Material Handling Equipment0000	0.0410	0.2893	0.2073	0.0004	0.0065	30.3	0.0037	
	120	Other Material Handling Equipment	Other Material Handling Equipment0051	0.0421	0.4076	0.2541	0.0007	0.0117	60.7	0.0038	
	175	Other Material Handling Equipment	Other Material Handling Equipment0121	0.0653	0.7197	0.3067	0.0014	0.0146	122	0.0059	
	250	Other Material Handling Equipment	Other Material Handling Equipment0176	0.0642	0.2920	0.2863	0.0016	0.0088	145	0.0058	
	500	Other Material Handling Equipment	Other Material Handling Equipment0251	0.0837	0.3670	0.3482	0.0019	0.0113	192	0.0075	
	9999	Other Material Handling Equipment	Other Material Handling Equipment0501	0.3781	1.4596	3.9555	0.0073	0.0764	741	0.0341	
Other Material Handling Equipment Composite				0.0696	0.4355	0.3844	0.0015	0.0124	141	0.0063	
Pavers	25	Pavers	Pavers0000	0.0225	0.0768	0.1422	0.0002	0.0053	18.7	0.0020	
	50	Pavers	Pavers0026	0.0574	0.2803	0.2102	0.0004	0.0114	28.0	0.0052	
	120	Pavers	Pavers0051	0.0662	0.4696	0.4003	0.0008	0.0263	68.2	0.0060	
	175	Pavers	Pavers0121	0.0899	0.7543	0.5238	0.0014	0.0286	128	0.0081	
	250	Pavers	Pavers0176	0.1097	0.4287	0.7020	0.0022	0.0254	194	0.0099	
	500	Pavers	Pavers0251	0.1263	0.5374	0.7572	0.0023	0.0284	233	0.0114	
Pavers Composite				0.0717	0.4745	0.3858	0.0009	0.0220	77.9	0.0065	
Paving Equipment	25	Paving Equipment	Paving Equipment0000	0.0152	0.0520	0.0963	0.0002	0.0036	12.6	0.0014	
	50	Paving Equipment	Paving Equipment0026	0.0468	0.2355	0.1789	0.0003	0.0095	23.9	0.0042	
	120	Paving Equipment	Paving Equipment0051	0.0503	0.3671	0.3092	0.0006	0.0200	54.5	0.0045	
	175	Paving Equipment	Paving Equipment0121	0.0687	0.5900	0.4021	0.0011	0.0219	101	0.0062	
	250	Paving Equipment	Paving Equipment0176	0.0672	0.2648	0.4289	0.0014	0.0154	122	0.0061	
Paving Equipment Composite				0.0548	0.3993	0.3281	0.0008	0.0190	68.9	0.0049	
Plate Compactors	15	Plate Compactors	Plate Compactors0000	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	
		Plate Compactors	Plate Compactors0016	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	
Plate Compactors Composite				0.0052	0.0301	0.0368	0.0001	0.0015	4.9	0.0005	
Pressure Washers	15	Pressure Washers	Pressure Washers0000	0.0087	0.0299	0.0555	0.0001	0.0022	7.1	0.0008	
	25	Pressure Washers	Pressure Washers0016	0.0079	0.0810	0.0843	0.0002	0.0019	14.3	0.0007	
	50	Pressure Washers	Pressure Washers0026	0.0082	0.1351	0.0897	0.0003	0.0031	24.1	0.0007	
	120	Pressure Washers	Pressure Washers0051	0.0066	0.0531	0.0561	0.0001	0.0019	9.4	0.0006	
Pressure Washers Composite				0.0089	0.0466	0.0560	0.0001	0.0024	7.4	0.0008	
Pumps	15	Pumps	Pumps0000	0.0244	0.0816	0.1512	0.0002	0.0061	19.5	0.0022	
	25	Pumps	Pumps0016	0.0299	0.2394	0.2138	0.0004	0.0061	34.3	0.0027	
	50	Pumps	Pumps0026	0.0365	0.4656	0.3062	0.0009	0.0129	77.9	0.0033	
	120	Pumps	Pumps0051	0.0499	0.7342	0.3301	0.0016	0.0142	140	0.0045	
	175	Pumps	Pumps0121	0.0572	0.3604	0.3745	0.0023	0.0107	201	0.0052	
	250	Pumps	Pumps0176	0.0599	0.6034	0.5922	0.0034	0.0178	345	0.0087	
	500	Pumps	Pumps0251	0.1593	0.9975	0.9991	0.0057	0.0297	571	0.0144	
	750	Pumps	Pumps0501	0.4488	2.4388	6.8114	0.0136	0.1186	1,355	0.0405	
	Pumps Composite				0.0696	0.4355	0.3844	0.0015	0.0124	141	0.0063

Table 53
SCAB Fleet Average Emission Factors (Diesel)

2025											
Air Basin	SC			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
Equipment	MaxHP			COG	CO	NOX	SOX	PM	CO2	CH4	
Pumps Composite		Pumps	Pumps10000	0.0270	0.2617	0.2079	0.0006	0.0078	49.6	0.0024	
Rollers	15	Rollers	Rollers0000	0.0074	0.386	0.0461	0.0001	0.0018	6.3	0.0007	
	25	Rollers	Rollers0016	0.0161	0.0549	0.1017	0.0002	0.0038	13.3	0.0015	
	50	Rollers	Rollers0026	0.0345	0.2258	0.1776	0.0003	0.0068	26.0	0.0031	
	120	Rollers	Rollers0051	0.0392	0.3801	0.2847	0.0007	0.0137	59.0	0.0035	
	175	Rollers	Rollers0121	0.0553	0.6096	0.3030	0.0012	0.0156	108	0.0050	
	250	Rollers	Rollers0176	0.0656	0.3037	0.3629	0.0017	0.0127	153	0.0059	
Rollers Composite	500	Rollers	Rollers0251	0.0920	0.4189	0.4752	0.0022	0.0174	219	0.0083	
		Rollers	Rollers0501	0.0410	0.3763	0.2501	0.0008	0.0122	67.0	0.0037	
Rough Terrain Forklifts	50	Rough Terrain Forklifts	Rough Terrain Forklifts0000	0.0381	0.3041	0.2193	0.0004	0.0054	33.9	0.0034	
	120	Rough Terrain Forklifts	Rough Terrain Forklifts0051	0.0369	0.4106	0.2316	0.0007	0.0087	62.4	0.0033	
	175	Rough Terrain Forklifts	Rough Terrain Forklifts0121	0.0569	0.7229	0.2450	0.0014	0.0112	125	0.0051	
	250	Rough Terrain Forklifts	Rough Terrain Forklifts0176	0.0671	0.3372	0.2625	0.0019	0.0084	171	0.0061	
	Rough Terrain Forklifts Composite	500	Rough Terrain Forklifts	Rough Terrain Forklifts0251	0.0999	0.4838	0.3682	0.0025	0.0123	257	0.0090
			Rough Terrain Forklifts	Rough Terrain Forklifts0501	0.0396	0.4430	0.2336	0.0008	0.0090	70.3	0.0036
Rubber Tired Dozers	175	Rubber Tired Dozers	Rubber Tired Dozers0000	0.1163	0.8019	0.6895	0.0015	0.0386	129	0.0105	
	250	Rubber Tired Dozers	Rubber Tired Dozers0176	0.1329	0.4624	0.8841	0.0021	0.0340	183	0.0120	
	500	Rubber Tired Dozers	Rubber Tired Dozers0251	0.1817	0.7490	1.1543	0.0026	0.0448	265	0.0164	
	750	Rubber Tired Dozers	Rubber Tired Dozers0501	0.2747	1.1262	1.7818	0.0040	0.0684	399	0.0248	
	Rubber Tired Dozers Composite	1000	Rubber Tired Dozers	Rubber Tired Dozers0751	0.4321	1.7954	4.5523	0.0060	0.1202	592	0.0390
			Rubber Tired Dozers	Rubber Tired Dozers1001	0.1672	0.6620	1.0824	0.0025	0.0419	239	0.0151
Rubber Tired Loaders	25	Rubber Tired Loaders	Rubber Tired Loaders0000	0.0204	0.0697	0.1291	0.0002	0.0048	16.9	0.0018	
	50	Rubber Tired Loaders	Rubber Tired Loaders0026	0.0418	0.2904	0.2109	0.0004	0.0069	31.1	0.0038	
	120	Rubber Tired Loaders	Rubber Tired Loaders0051	0.0397	0.3916	0.2476	0.0007	0.0115	58.9	0.0036	
	175	Rubber Tired Loaders	Rubber Tired Loaders0121	0.0546	0.6199	0.2592	0.0012	0.0130	106	0.0049	
	250	Rubber Tired Loaders	Rubber Tired Loaders0176	0.0661	0.3041	0.3040	0.0017	0.0107	149	0.0060	
	500	Rubber Tired Loaders	Rubber Tired Loaders0251	0.1034	0.4654	0.4455	0.0023	0.0164	237	0.0093	
	750	Rubber Tired Loaders	Rubber Tired Loaders0501	0.2119	0.9532	0.9273	0.0049	0.0338	486	0.0191	
	Rubber Tired Loaders Composite	1000	Rubber Tired Loaders	Rubber Tired Loaders0751	0.2701	1.1927	3.2272	0.0060	0.0615	594	0.0244
			Rubber Tired Loaders	Rubber Tired Loaders1001	0.0559	0.4311	0.2835	0.0012	0.0121	109	0.0050
	Scrapers	120	Scrapers	Scrapers0000	0.0887	0.6472	0.5218	0.0011	0.0330	93.9	0.0080
175		Scrapers	Scrapers0121	0.1025	0.8864	0.5654	0.0017	0.0307	148	0.0092	
250		Scrapers	Scrapers0176	0.1187	0.4642	0.7040	0.0024	0.0254	209	0.0107	
500		Scrapers	Scrapers0251	0.1755	0.7332	0.9727	0.0032	0.0364	321	0.0158	
Scrapers Composite		750	Scrapers	Scrapers0501	0.3043	1.2657	1.7266	0.0056	0.0638	555	0.0275
			Scrapers	Scrapers0751	0.1495	0.7187	0.8387	0.0027	0.0335	262	0.0135
Signal Boards	15	Signal Boards	Signal Boards0000	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006	
	50	Signal Boards	Signal Boards0016	0.0332	0.2686	0.2268	0.0005	0.0063	36.2	0.0030	
	120	Signal Boards	Signal Boards0051	0.0394	0.4898	0.3076	0.0009	0.0127	80.2	0.0036	
	175	Signal Boards	Signal Boards0121	0.0587	0.8292	0.3433	0.0017	0.0152	155	0.0053	
	250	Signal Boards	Signal Boards0176	0.0794	0.4676	0.4435	0.0029	0.0132	255	0.0072	
Signal Boards Composite		Signal Boards	Signal Boards0251	0.0111	0.9909	0.0718	0.0002	0.0029	16.7	0.0010	
Skid Steer Loaders	25	Skid Steer Loaders	Skid Steer Loaders0000	0.0167	0.0568	0.1055	0.0002	0.0040	13.8	0.0015	
	50	Skid Steer Loaders	Skid Steer Loaders0026	0.0194	0.1977	0.1446	0.0003	0.0015	25.5	0.0017	
	120	Skid Steer Loaders	Skid Steer Loaders0051	0.0175	0.2665	0.1240	0.0005	0.0022	42.8	0.0016	
Skid Steer Loaders Composite		Skid Steer Loaders	Skid Steer Loaders0121	0.0186	0.2104	0.1354	0.0004	0.0019	30.3	0.0017	
Surfacing Equipment	50	Surfacing Equipment	Surfacing Equipment0000	0.0171	0.1105	0.0934	0.0002	0.0035	14.1	0.0015	
	120	Surfacing Equipment	Surfacing Equipment0051	0.0385	0.3950	0.2869	0.0007	0.0146	63.8	0.0035	
	175	Surfacing Equipment	Surfacing Equipment0121	0.0386	0.4642	0.2429	0.0010	0.0119	85.8	0.0035	
	250	Surfacing Equipment	Surfacing Equipment0176	0.0504	0.2804	0.3275	0.0015	0.0111	135	0.0045	
	500	Surfacing Equipment	Surfacing Equipment0251	0.0800	0.4236	0.4893	0.0022	0.0174	221	0.0072	
	750	Surfacing Equipment	Surfacing Equipment0501	0.1260	0.6643	0.7833	0.0035	0.0275	347	0.0114	
Surfacing Equipment Composite		Surfacing Equipment	Surfacing Equipment0751	0.0638	0.3590	0.3924	0.0017	0.0142	166	0.0058	

Table 53
SCAB Fleet Average Emission Factors (Diesel)

		2025									
Air Basin		SC									
Equipment	MaxHP			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
				ROG	CO	NOx	SOx	PM	CO2	CH4	
Sweepers/Scrubbers	15	Sweepers/Scrubbers	Sweepers/Scrubbers000	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011	
	25	Sweepers/Scrubbers	Sweepers/Scrubbers0016	0.0237	0.0808	0.1495	0.0002	0.0056	19.6	0.0021	
	50	Sweepers/Scrubbers	Sweepers/Scrubbers0026	0.0308	0.2762	0.1942	0.0004	0.0033	31.6	0.0028	
	120	Sweepers/Scrubbers	Sweepers/Scrubbers0051	0.0395	0.4895	0.2530	0.0009	0.0068	75.0	0.0036	
	175	Sweepers/Scrubbers	Sweepers/Scrubbers0121	0.0565	0.8005	0.2201	0.0016	0.0084	139	0.0051	
250	Sweepers/Scrubbers	Sweepers/Scrubbers0176	0.0587	0.3179	0.1898	0.0018	0.0062	162	0.0053		
Sweepers/Scrubbers Composite			Sweepers/Scrubbers0251	0.0410	0.4840	0.2255	0.0009	0.0061	78.5	0.0037	
Tractors/Loaders/Backhoes	25	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0000	0.0191	0.0653	0.1209	0.0002	0.0045	15.9	0.0017	
	50	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0026	0.0316	0.2678	0.1895	0.0004	0.0037	30.3	0.0029	
	120	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0051	0.0281	0.3379	0.1761	0.0006	0.0055	51.7	0.0025	
	175	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0121	0.0420	0.5839	0.1613	0.0011	0.0072	101	0.0038	
	250	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0176	0.0633	0.3389	0.2157	0.0019	0.0073	172	0.0057	
	500	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes0251	0.1263	0.6506	0.4127	0.0039	0.0144	345	0.0114	
Tractors/Loaders/Backhoes Composite			Tractors/Loaders/Backhoes0501	0.1896	0.9760	0.6256	0.0058	0.0216	517	0.0171	
Trenchers	15	Trenchers	Trenchers0000	0.0099	0.0517	0.0817	0.0001	0.0024	8.5	0.0009	
	25	Trenchers	Trenchers0016	0.0397	0.1355	0.2509	0.0004	0.0094	32.9	0.0036	
	50	Trenchers	Trenchers0026	0.0687	0.3197	0.2467	0.0004	0.0140	32.9	0.0062	
	120	Trenchers	Trenchers0051	0.0625	0.4341	0.3863	0.0008	0.0259	64.9	0.0056	
	175	Trenchers	Trenchers0121	0.1009	0.8327	0.6152	0.0016	0.0338	144	0.0091	
	250	Trenchers	Trenchers0176	0.1247	0.4925	0.8480	0.0025	0.0309	223	0.0112	
	500	Trenchers	Trenchers0251	0.1661	0.7370	1.0663	0.0031	0.0400	311	0.0150	
	750	Trenchers	Trenchers0501	0.3147	1.3882	2.0666	0.0059	0.0766	587	0.0284	
	Trenchers Composite			Trenchers0751	0.0674	0.4085	0.3481	0.0007	0.0215	58.7	0.0061
	Welders	15	Welders	Welders0000	0.0075	0.0381	0.0468	0.0001	0.0020	6.2	0.0007
25		Welders	Welders0016	0.0141	0.0473	0.0876	0.0001	0.0035	11.3	0.0013	
50		Welders	Welders0026	0.0280	0.2077	0.1684	0.0003	0.0053	26.0	0.0025	
120		Welders	Welders0051	0.0223	0.2476	0.1601	0.0005	0.0073	39.5	0.0020	
175		Welders	Welders0121	0.0430	0.5400	0.2396	0.0011	0.0111	98.2	0.0039	
250		Welders	Welders0176	0.0423	0.2236	0.2294	0.0013	0.0069	119	0.0038	
Welders Composite			Welders0251	0.0585	0.3040	0.2969	0.0016	0.0095	168	0.0053	
				0.0214	0.1745	0.1373	0.0003	0.0052	25.6	0.0019	

Source: File off-road-mobile-source-emission-factors-scenario-years-2007-2025).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>

Table 54
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories:
Passenger Vehicles & Delivery Trucks.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

$$\text{Emissions (pounds per day)} = N \times TL \times EF$$

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: 2025		All model years in the range 1981 to 2025	
Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00342738	CO	0.00595363
NOx	0.00028846	NOx	0.00615945
ROG	0.00043545	ROG	0.00092178
SOx	0.00001070	SOx	0.00002761
PM10	0.00009679	PM10	0.00028425
PM2.5	0.00006418	PM2.5	0.00020958
CO2	1.11078571	CO2	2.88143570
CH4	0.00003641	CH4	0.00003765

Source: File on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from <http://www.aqmd.gov/home/rules-compliance/ceqa/>

Table 55
Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

$$\text{Emissions (pounds per day)} = N \times TL \times EF$$

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: 2025		All model years in the range 1981 to 2025	
HHDT-DSL (pounds/mile)		HHDT-DSL, Exh (pounds/mile)	
CO	0.00431086	PM10	0.00034397
NOx	0.00932573	PM2.5	0.00031664
ROG	0.00080206		
SOx	0.00004018		
PM10	0.00048541		
PM2.5	0.00036326		
CO2	4.19512979		
CH4	0.00003697		

Source: File heavy-heavy-duty-on-road-vehicles-(scenario-years-2007-2026).xls, downloaded from [http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-\(v2-3\)-emission-factors-\(on-road\)](http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/emfac-2007-(v2-3)-emission-factors-(on-road))

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
1/2-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1/2-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
1-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
10-cu. yd. Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
10-cu. yd. Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
10-cu. yd. Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
1-Ton Crew Cab Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
1-Ton Crew Cab, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Crew Cab, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
1-Ton Flat Bed, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
1-Ton Flat Bed, 4x4	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
3/4-Ton Pick-up Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Pick-up Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
3/4-Ton Truck, 4x4	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
3/4-Ton Truck, 4x4	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
40' Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
40' Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Asphalt Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Asphalt Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Carry-all Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Carry-all Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Concrete Mixer Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Mixer Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Concrete Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Concrete Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Crew Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
Crew Vehicle	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crew Vehicle	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
Crewcab Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crewcab Truck	Unpaved	7.5	5	1.24E+00	1.24E-01	55%	5.56E-01	5.56E-02
Crushed Rock Delivery Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Crushed Rock Delivery Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Dump Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Dump Truck (Trash)	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Dump Truck (Trash)	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Extendable Flat Bed Pole Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Extendable Flat Bed Pole Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Flat Bed Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flat Bed Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Flatbed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Flatbed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Fuel, Helicopter Support Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Fuel, Helicopter Support Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Jet A Fuel Truck	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Jet A Fuel Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Low Bed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Low Bed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Lowboy Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Lowboy Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Maintenance Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00

Table 56
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface	Silt Loading (sL, g/m ²) or Silt Content (s, %) ^a	Average Weight (W) (tons) ^b	Un-controlled PM10 Emission Factor (lb/VMT) ^c	Un-controlled PM2.5 Emission Factor (lb/VMT) ^c	Control Efficiency (%) ^d	Controlled PM10 Emission Factor (lb/VMT) ^e	Controlled PM2.5 Emission Factor (lb/VMT) ^e
Maintenance Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	55%	7.60E-01	7.60E-02
Pipe Truck/Trailer	Paved	0.035	3.4	9.22E-04	0.00E+00	0%	9.22E-04	0.00E+00
Pipe Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Reel Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Reel Truck	Unpaved	7.5	10	1.69E+00	1.69E-01	55%	7.60E-01	7.60E-02
Stake Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stake Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Stakebed Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Stakebed Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Truck, Semi Tractor	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Truck, Semi Tractor	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Van	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Van	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Water Truck	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Water Truck	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Wire Truck/Trailer	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Wire Truck/Trailer	Unpaved	7.5	17	2.14E+00	2.14E-01	55%	9.65E-01	9.65E-02
Worker Commute	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Worker Commute	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Transmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Transmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Subtransmission Line Inspection	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Subtransmission Line Inspection	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02
Substation Site Visit	Paved	0.035	3.2	8.01E-04	0.00E+00	0%	8.01E-04	0.00E+00
Substation Site Visit	Unpaved	7.5	3.2	1.01E+00	1.01E-01	55%	4.55E-01	4.55E-02

^a Paved road silt loading from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997) for collector roads, <http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf>

Unpaved road silt content from SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden

^b Average paved on-road vehicle weight in Riverside County from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

Unpaved worker commuting weight on access road assumed to be same as paved road weight

Unpaved weight for other trucks is based on upper limit of 33,000 lbs for medium heavy-duty trucks.

^c Equations:

$EF(\text{paved}) = k_p (sL/2)^{0.65} (W/3)^{1.5} - C$

Ref: AP-42, Section 13.2.1, "Paved Rods," November 2006

$EF(\text{unpaved}) = k_u (s/12)^a (W/3)^b$

Ref: AP-42, Section 13.2.2, "Unpaved Rods," November 2006

Constants:

$k_p =$	0.016	(Particle size multiplier for PM10)
	0.0024	(Particle size multiplier for PM2.5)
$C =$	0.00047	(Exhaust, brake wear and tire wear adjustment, PM10)
	0.00036	(Exhaust, brake wear and tire wear adjustment, PM2.5)
$k_u =$	1.5	(Particle size multiplier for PM)
	0.15	(Particle size multiplier for PM2.5)
$a =$	0.9	for PM10
	0.9	for PM2.5
$b =$	0.45	for PM10
	0.45	for PM2.5

^d Control efficiency from watering unpaved roads twice per day, from Table XI-D, Mitigation Measure Examples, Fugitive Dust from Unpaved Roads, http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html

^e Controlled emission factor [lb/mi] = Uncontrolled emission factor [lb/mi] x (1 - Control efficiency [%] / 100)

Table 57
Fugitive Dust Emission Factors
Soil Dropping During Excavation

Emission Factor [lb/cu. yd] = $0.0011 \times (\text{mean wind speed [mi/hr]} / 5)^{1.3} / (\text{moisture [\%]} / 2)^{1.4} \times (\text{number drops per ton}) \times (\text{density [ton/cu. yd]})$
 Reference: AP-42, Equation (1), Section 13.2.4, November 2006

Parameter	Value	Basis
Mean Wind Speed	12	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G, default
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil
Number Drops	4	Assumption
Soil Density	1.215	Table 2.46, Handbook of Solid Waste Management

PM10 Emission Factor (Uncontrolled) 9.94E-04 lb/cu. yd

Reduction from Watering Twice/Day^b 0%

Controlled PM10 Emission Factor 9.94E-04 lb/cu. yd

Controlled PM2.5 Emission Factor^a 2.07E-04 lb/cu. yd

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per cubic yard] x Volume soil handled [cubic yards per day]

Table 57
Fugitive Dust Emission Factors
Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
 Reference: SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-E

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Pct. time wind > 12 mph	100	Worst-case assumption

PM10 Emission Factor (Uncontrolled) 44.0 lb/day-acre
 Reduction from Watering Twice/Day 50%
 Controlled PM10 Emission Factor 22.0 lb/day-acre
 Controlled PM2.5 Emission Factor^a 4.6 lb/day-acre

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final-Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per acre-day] x Storage pile surface area [acres]

Table 57
Fugitive Dust Emission Factors
Bulldozing, Scraping and Grading

Emission Factor [lb/hr] = 0.75 x (silt content [%])^{1.5} / (moisture)^{1.4}
 Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil

PM10 Emission Factor (Uncontrolled) 0.348 lb/hr
 Reduction from Watering Twice/Day 0%
 Controlled PM10 Emission Factor 0.348 lb/hr
 Controlled PM2.5 Emission Factor^a 0.072 lb/hr

^a PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
 PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5
 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

^b Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing, scraping or grading time [hours/day]