

Table A-1
 Construction Heavy Equipment Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment A

Table A-1. 2016 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment A

Emission Factors														Emissions										
Equipment/Phase	Source	FUEL	HP	Load Factor	ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day
OFFROAD Equipment																								
Foundation Excavation																								
Drill Rig	CalEEMod User's Guide, Appendix D, 2016 Bore/Drill Rigs, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	82	0.5	0.0006	0.0082	0.0117	0.0000	0.0007	0.000588624	1.3	0.0002	0.0011	1	10	0.23	3.34	4.81	0.01	0.27	0.24	513.69	0.08	0.46
Foundation Concrete																								
Generator	CalEEMod User's Guide, Appendix D, 2016 Generators, 26/50 hp; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	50	0.74	0.0025	0.0090	0.0117	0.0000	0.0010	0.000882937	1.3	0.0001	0.0011	1	10	0.93	3.34	4.34	0.00	0.37	0.33	463.57	0.04	0.41
On-Road Certified Truck Emissions					ROG (lbs/hr)	CO (lbs/hr)	NOX (lbs/hr)	SOX (lbs/hr)	PM10 (lbs/hr)	PM2.5 (lbs/hr)	CO2 (lbs/hr)	CH4 (lbs/hr)	N2O (lbs/hr)											
Foundation Excavation																								
Dump/Haul Truck	EMFAC2011 emission factors, HHDT idling	DIESEL	400	0.38	0.0132	0.0736	0.1318	0.0001	0.0003	0.000317344	15.0	0.0006	0.0125	1	5	0.07	0.37	0.66	0.00	0.00	0.00	74.97	0.00	0.06
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	10	0.04	0.49	1.62	0.00	0.01	0.01	160.41	0.00	0.15
Subtotal																								
Foundation Rebar																								
Crane Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	10	0.04	0.49	1.62	0.00	0.01	0.01	160.41	0.00	0.15
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	5	0.02	0.24	0.81	0.00	0.00	0.00	80.20	0.00	0.08
Subtotal																								
Foundation Concrete																								
2-ton Flatbed Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	2	0.01	0.10	0.32	0.00	0.00	0.00	32.08	0.00	0.03
Concrete Trucks	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	3	10	0.13	1.47	4.86	0.00	0.02	0.02	481.23	0.01	0.46
Crane Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	2	0.01	0.10	0.32	0.00	0.00	0.00	32.08	0.00	0.03
Flatbed Boom Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	2	0.01	0.10	0.32	0.00	0.00	0.00	32.08	0.00	0.03
Subtotal																1.50	10.04	19.69	0.02	0.68	0.60	2030.72	0.14	1.87
Simultaneous Construction Equipment																1.50	10.04	19.69	0.02	0.68	0.60	2030.72	0.14	1.87

Table A-2
Construction and Operational Truck Trip Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project
Segment A

Table A-2. 2016 Maximum Daily Construction Emissions, Construction Truck Trips, Segment A

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10		PM2.5			CO2	CH4	N2O	Emissions, lbs/day													
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4
Foundation Excavation																														
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	3	30	20	0.292950056	0.47693085	0.06521049	0.00318614	0.05395477	0.00799996	0.03674982	0.04963839	0.002	0.0157499	247.933018	0.01416764	0.01	0.04	0.06	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	32.80	0.00	0.00
Dump Truck	Heavy Duty Truck, Diesel	1	30	60	1.111513533	5.1835677	0.30038695	0.01071182	0.06981799	0.03599981	0.06173968	0.06423255	0.009	0.0264599	1807.66928	0.10329565	0.05	0.15	0.69	0.04	0.00	0.02	0.01	0.01	0.00	0.00	239.11	0.01	0.01	
Water Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	0.00	33.35	0.00	0.00	
Subtotal																		0.24	0.95	0.06	0.00	0.04	0.03	0.02	0.01	0.00	305.26	0.02	0.01	
Foundation Rebar/AB																														
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.47693085	0.06521049	0.00318614	0.05395477	0.00799996	0.03674982	0.04963839	0.002	0.0157499	247.933018	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.01	0.00	0.00	21.86	0.00	0.00	
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	1	30	20	0.292950056	0.47693085	0.06521049	0.00318614	0.05395477	0.00799996	0.03674982	0.04963839	0.002	0.0157499	247.933018	0.01416764	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.93	0.00	0.00	
Foundation Concrete																														
Crane Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	0.00	22.23	0.00	0.00	
Dump Truck	Heavy Duty Truck, Diesel	1	30	60	1.111513533	5.1835677	0.30038695	0.01071182	0.06981799	0.03599981	0.06173968	0.06423255	0.009	0.0264599	1807.66928	0.10329565	0.05	0.15	0.69	0.04	0.00	0.02	0.01	0.01	0.00	0.00	239.11	0.01	0.01	
Line Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	0.00	22.23	0.00	0.00	
Mobile Fueling Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	0.00	33.35	0.00	0.00	
Water Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	0.00	33.35	0.00	0.00	
Subtotal																		0.37	1.43	0.09	0.00	0.07	0.04	0.03	0.01	0.00	383.07	0.02	0.01	
Foundation Concrete																														
2-ton Flatbed Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	0.00	22.23	0.00	0.00	
Concrete Trucks	Light Heavy Duty Truck, Diesel	3	30	30	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.16	0.61	0.03	0.00	0.03	0.02	0.01	0.00	0.00	100.05	0.01	0.00	
Crane Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	0.00	22.23	0.00	0.00	
Flatbed Boom Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.07224465	0.17343261	0.00318614	0.03981854	0.01199994	0.08917953	0.03663306	0.003	0.0382198	504.222339	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	0.00	22.23	0.00	0.00	
Pick-Up Trucks	Light Duty Truck 1, Diesel	4	30	20	0.292950056	0.47693085	0.06521049	0.00318614	0.05395477	0.00799996	0.03674982	0.04963839	0.002	0.0157499	247.933018	0.01416764	0.01	0.05	0.08	0.01	0.00	0.02	0.01	0.01	0.00	0.00	43.73	0.00	0.00	
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	1	30	20	0.292950056	0.47693085	0.06521049	0.00318614	0.05395477	0.00799996	0.03674982	0.04963839	0.002	0.0157499	247.933018	0.01416764	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.93	0.00	0.00	
Subtotal																		0.34	1.12	0.07	0.00	0.07	0.04	0.03	0.00	221.40	0.01	0.01		
Simultaneous Construction Trucks																														
																	0.95	3.50	0.22	0.01	0.18	0.11	0.09	0.02	909.74	0.05	0.02			

Table A-3. 2016 Maximum Daily Construction Emissions, Worker Trips, Segment A

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG						SO _x		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Structure Demolition	Light-Duty Truck, catalyst	48	35	80	2.361162204	31.42447989	0.22493614	1.813681924	0.057965153	2.394636679	1.621971872	0.707094998	0.16038404	0.714647031	0.0041277	0.005714994	0.00321577	0.02919863	0.008	0.03675	0.0029606	0.026884174	0.002	0.01575	308.6379	448.5481762	0.0032779	0.022095932	0.01	0.009722282
Wire Demolition	Light-Duty Truck, catalyst	49	35	80	2.361162204	31.42447989	0.22493614	1.813681924	0.057965153	2.394636679	1.621971872	0.707094998	0.16038404	0.714647031	0.0041277	0.005714994	0.00321577	0.02919863	0.008	0.03675	0.0029606	0.026884174	0.002	0.01575	308.6379	448.5481762	0.0032779	0.022095932	0.01	0.009722282

EMFAC2011 emission factors for 2016
 Assume startup after 8 hours

Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Structure Demolition	Light-Duty Truck, catalyst	48	35	80	23.31	2.10	2.42	0.04	0.41	0.18	0.12	0.03	2660.33	0.03	0.08
Wire Demolition	Light-Duty Truck, catalyst	49	35	80	23.80	2.14	2.47	0.04	0.42	0.18	0.12	0.03	2715.76	0.03	0.08
Simultaneous Worker Trips		97			47.11	4.24	4.90	0.07	0.83	0.36	0.25	0.06	5376.09	0.06	0.16

Table A-4
Fugitive Dust Emission Calculations
Sycamore to Peñasquitos 230 kV Transmission Line Project
Segment A

Table A-4. 2016 Maximum Daily Construction Emissions, Fugitive Dust, Segment A

Demolition

Earthmoving - Material Handling, loading debris into trucks

Amount based on CalEEMod Methodology from MRI reference, assuming 213,969 square feet of material for wire and structure

0.046 tons of material per square foot = 19,685 tons of debris

Days of demolition 33 days

Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G

$$E = [0.00112 \times \{ \{G/5\}^{1.3} / \{H/2\}^{1.4} \}] \times [I/J]$$

where

G = Mean wind speed in miles per hour- based on data from the website below, assuming a maximum wind speed of 12 mph

H = Moisture content of surface material, assumed to be 2%

I = Pounds of overburden handled per day

J = lbs/ton, 2000

Assume H = 2.0% moisture - unmitigated

Assume 61% control efficiency for watering 3 times/day

Assume earthmoving occurs over 33 days, maximum per day could be 10 x daily

$$E = [0.00112 \times \{ \{G/5\}^{1.3} / \{H/2\}^{1.4} \}] \times [I/J] =$$

0.003495366

PM10

Unmitigated	Mitigated	Unit
20.85054357	8.13171199	lbs/day
0.034403397	0.013417325	total tons

PM2.5

Unmitigated	Mitigated	Unit

<https://weatherspark.com/averages/31552/San-Diego-California-United-States>

Table A-5
Construction Heavy Equipment Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project
Segment B

Table A-5. 2016 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment B

Equipment/Phase	Source	Emission Factors												Emissions										
		FUEL	HP	Load Factor	ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day
OFFROAD Equipment																								
Trenching																								
Concrete Saw	CalEEMod User's Guide, Appendix D, 2016 Concrete Saws, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	81	0.73	0.0014	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	2	10	1.62	9.65	12.31	0.02	0.78	0.70	1481.67	0.14	1.17
Rubber Tired Loader	CalEEMod User's Guide, Appendix D, 2016 Rubber Tired Loaders, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	78	0.37	0.0016	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	2	10	0.95	4.71	6.01	0.01	0.38	0.34	723.17	0.09	0.57
Backhoe	CalEEMod User's Guide, Appendix D, 2016 Tractor/Loader/Backhoe, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	97	0.37	0.0013	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	4	10	1.82	11.71	14.94	0.02	0.95	0.85	1798.65	0.16	1.42
Loader	CalEEMod User's Guide, Appendix D, 2016 Tractor/Loader/Backhoe, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	97	0.37	0.0013	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	4	10	1.82	11.71	14.94	0.02	0.95	0.85	1798.65	0.16	1.42
Backfill/Paving																								
Backhoe	CalEEMod User's Guide, Appendix D, 2016 Tractor/Loader/Backhoe, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	97	0.37	0.0013	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	2	10	0.91	5.86	7.47	0.01	0.47	0.42	899.33	0.08	0.71
On-Road Certified Truck Emissions																								
Trenching																								
Dump/Haul Truck	EMFAC2011 emission factors, HHDT idling	DIESEL	400	0.38	0.0132	0.0736	0.1318	0.0001	0.0003	0.000317344	15.0	0.0006	0.0125	20	2	0.53	2.94	5.27	0.01	0.01	0.01	599.80	0.02	0.50
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	10	0.04	0.49	1.62	0.00	0.01	0.01	160.41	0.00	0.15
Subtotal																								
Backfill/Paving																								
Flatbed Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	2	0.01	0.10	0.32	0.00	0.00	0.00	32.08	0.00	0.03
Subtotal																								
Simultaneous Construction Equipment																								
															7.70	47.16	62.89	0.08	3.56	3.17	7493.75	0.66	5.97	

Table A-6
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment B

Table A-6. 2016 Maximum Daily Construction Emissions, Construction Truck Trips, Segment B

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10		PM2.5		CO ₂	CH ₄	N ₂ O	Emissions, lbs/day												
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂	CH ₄	N ₂ O
Trenching																												
Pick-Up Trucks	Light Duty Truck 1, Diesel	4	30	20	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.00799996	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.05	0.08	0.01	0.00	0.02	0.01	0.02	0.00	43.73	0.00	0.00
Dump Truck	Heavy Duty Truck, Diesel	20	30	60	1.111513533	5.1835677	0.30038695	0.0107118	0.069818	0.03599981	0.06173968	0.0642326	0.009	0.0264599	1807.6693	0.10329565	0.05	2.94	13.71	0.79	0.03	0.44	0.26	0.30	0.07	4782.30	0.27	0.12
Water Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.01199994	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	33.35	0.00	0.00
Subtotal																		3.05	14.00	0.82	0.03	0.47	0.28	0.32	0.08	4859.38	0.28	0.12
Backfill/Paving																												
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.00799996	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.01	0.00	21.86	0.00	0.00
Concrete Trucks	Light Heavy Duty Truck, Diesel	9	30	30	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.01199994	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.49	1.83	0.10	0.00	0.08	0.05	0.07	0.02	300.14	0.02	0.01
Subtotal																		0.52	1.87	0.11	0.00	0.09	0.05	0.08	0.02	322.00	0.02	0.01
Simultaneous Construction Trucks																		3.56	15.87	0.93	0.03	0.56	0.33	0.40	0.10	5181.38	0.30	0.13

Table A-7
Construction and Operations Worker Commute Emission Calculations
Sycamore to Peñasquitos 230 kV Transmission Line Project
Segment B

Table A-7. 2016 Maximum Daily Construction Emissions, Worker Trips, Segment B

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				CO2		CH4		N2O		
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Trenching	Light-Duty Truck, catalyst	30	35	80	2.361162204	31.42447989	0.22493614	1.813681924	0.057965153	2.394636679	1.621971872	0.707094998	0.16038404	0.714647031	0.0041277	0.00571499	0.00321577	0.0291986	0.008	0.03675	0.0029606	0.026884174	0.002	0.01575	308.6379	448.5481762	0.0032779	0.02209593	0.01	0.00972228

EMFAC2011 emission factors for 2016

Assume startup after 8 hours
Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Trenching	Light-Duty Truck, catalyst	30	35	80	14.57	1.31	1.51	0.02	0.26	0.11	0.08	0.02	1662.71	0.02	0.05
Simultaneous Worker Trips		30			14.57	1.31	1.51	0.02	0.26	0.11	0.08	0.02	1662.71	0.02	0.05

Table A-8
 Fugitive Dust Emission Calculations
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment B

Table A-8. 2016 Maximum Daily Construction Emissions, Fugitive Dust, Segment B

Trenching

Earthmoving - Material Handling

Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G

$$E = [0.00112 \times \{([G/5]^{1.3})/([H/2]^{1.4})\}] \times [I/J]$$

where

G = Mean wind speed in miles per hour- based on data from the website below, assuming a maximum wind speed of 12 mph

H = Moisture content of surface material, assumed to be 2%

I = Pounds of overburden handled per day

J = lbs/ton, 2000

Assume 12 miles per hour daily maximum wind speed

Assume H = 2.0% moisture - unmitigated

Assume 61% control efficiency for watering 3 times/day

I = 16,200 cubic yards x 1600 lbs/cubic yard = 12960 tons of material

Assume earthmoving occurs over 30 days, maximum per day could be 10 x daily average

PM10

Unmitigated	Mitigated	Unit
15.0999804	5.888992358	lbs/day
0.00791025	0.003084999	total tons

$$E = [0.00112 \times \{([G/5]^{1.3})/([H/2]^{1.4})\}] \times [I/J] =$$

PM2.5

Unmitigated	Mitigated	Unit
3.17099589	1.236688395	lbs/day
0.00166115	0.00064785	total tons

NOTE: PM2.5 is assumed to be 21% of PM10 based on SCAQMD's Final –Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds (October 2006)

Table A-9
 Construction Heavy Equipment Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment C

Table A-9. 2016 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment C

Equipment/Phase	Source	Emission Factors													Emissions									
		FUEL	HP	Load Factor	ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day
OFFROAD Equipment																								
Road/Pad Maintenance																								
Backhoe	CalEEMod User's Guide, Appendix D, 2016 Tractor/Loader/Backhoe, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	97	0.37	0.0013	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	1	5	0.23	1.46	1.87	0.00	0.12	0.11	224.83	0.02	0.18
Bulldozer	CalEEMod User's Guide, Appendix D, 2016 Rubber Tired Dozers, 251/500 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	255	0.4	0.0013	0.0057	0.0091	0.0000	0.0003	0.000294312	1.3	0.0001	0.0009	1	5	0.67	2.92	4.62	0.01	0.17	0.15	638.97	0.06	0.44
Grader	CalEEMod User's Guide, Appendix D, 2016 Graders, 121/175 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	174	0.41	0.0012	0.0082	0.0091	0.0000	0.0005	0.000431658	1.3	0.0001	0.0009	1	10	0.88	5.82	6.47	0.01	0.35	0.31	893.81	0.08	0.61
Mower	CalEEMod User's Guide, Appendix D, 2016 Other Construction Equipment, 15/25 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	25	0.42	0.0015	0.0090	0.0117	0.0000	0.0010	0.000882937	1.3	0.0001	0.0011	1	5	0.08	0.47	0.62	0.00	0.05	0.05	65.78	0.01	0.06
Generator	CalEEMod User's Guide, Appendix D, 2016 Generators, 26/50 hp; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	50	0.74	0.0025	0.0082	0.0117	0.0000	0.0007	0.000588624	1.3	0.0001	0.0011	1	10	0.93	3.02	4.34	0.00	0.24	0.22	463.57	0.04	0.41
On-Road Certified Truck Emissions																								
Road/Pad Maintenance																								
Dump/Haul Truck	EMFAC2011 emission factors, HHDT idling	DIESEL	400	0.38	0.0132	0.0736	0.1318	0.0001	0.0003	0.000317344	15.0	0.0006	0.0125	1	5	0.07	0.37	0.66	0.00	0.00	0.00	74.97	0.00	0.06
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	10	0.04	0.49	1.62	0.00	0.01	0.01	160.41	0.00	0.15
Subtotal																								
Simultaneous Construction Equipment															2.90	14.55	20.20	0.03	0.94	0.84	2522.35	0.21	1.92	

Table A-10
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment C

Table A-10. 2016 Maximum Daily Construction Emissions, Construction Truck Trips, Segment C

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10			PM2.5			CO ₂	CH ₄	N ₂ O	Emissions, lbs/day																						
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂	CH ₄	N ₂ O												
Road Pad/Maintenance																																								
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.47693085	0.06521049	0.0031861	0.05395477	0.00799996	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.86	0.00	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	1	30	20	0.292950056	0.47693085	0.06521049	0.0031861	0.05395477	0.00799996	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.93	0.00	0.00	
Dump Truck	Heavy Duty Truck, Diesel	1	30	60	1.111513533	5.1835677	0.30038695	0.0107118	0.06981799	0.03599981	0.06173968	0.0642326	0.009	0.0264599	1807.6693	0.10329565	0.05	0.15	0.69	0.04	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	239.11	0.01	0.01		
Water Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.07224465	0.17343261	0.0031861	0.03981854	0.01199994	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.35	0.00	0.00			
Subtotal																		0.24	0.95	0.06	0.00	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	305.26	0.02	0.01			
Simultaneous Construction Trucks																		0.24	0.95	0.06	0.00	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	305.26	0.02	0.01				

Table A-11
 Construction and Operations Worker Commute Emission Calculations
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment C

Table A-11. 2016 Maximum Daily Construction Emissions, Worker Trips, Segment C

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				CO ₂		CH ₄		N ₂ O		
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Segment C	Light-Duty Truck, catalyst	31	35	80	2.361162	31.42448	0.224936	1.8136819	0.057965	2.39463668	1.6219719	0.707095	0.16038404	0.714647031	0.004128	0.005715	0.003216	0.02919863	0.008	0.03675	0.002961	0.02688417	0.002	0.01575	308.6379	448.548176	0.003278	0.02209593	0.01	0.00972228

EMFAC2011 emission factors for 2016
 Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂	CH ₄	N ₂ O
Segment C	Light-Duty Truck, catalyst	31	35	80	15.06	1.35	1.57	0.02	0.26	0.12	0.08	0.02	1718.13	0.02	0.05
Simultaneous Worker Trips		31			15.06	1.35	1.57	0.02	0.26	0.12	0.08	0.02	1718.13	0.02	0.05

Table A-12
Fugitive Dust Emission Calculations
Sycamore to Peñasquitos 230 kV Transmission Line Project
Segment C

Table A-12. 2016 Maximum Daily Construction Emissions, Fugitive Dust, Segment C

Site Preparation - Road/Pad Maintenance

Grading - Bulldozer Operations

Emission factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-F

$$E = ([0.45 \times \{([G]^{1.5})/([H]^{1.4})\}] \times I) \times J$$

where

G = silt content of material in percent, assumed to be 7.5%

Assume H = 2.0% moisture - unmitigated

Assume 61% control efficiency for watering 3 times/day

I = 2.2046 lb/kg

J = hours of bulldozing operations, based on construction scenario, 8 hrs/day for 25 days

$$E = ([0.45 \times \{([G]^{1.5})/([H]^{1.4})\}] \times I) \times J =$$

PM10

Unmitigated	Mitigated	Unit
61.7706548	24.09055537	lbs/day
0.77213318	0.301131942	total tons

PM2.5

Unmitigated	Mitigated	Unit
12.9718375	5.059016627	lbs/day
0.16214797	0.063237708	total tons

NOTE: PM2.5 is assumed to be 21% of PM10 based on SCAQMD's Final
–Methodology to Calculate Particulate Matter (PM) 2.5
and PM 2.5 Significance Thresholds (October 2006)

Table A-13
 Construction Heavy Equipment Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment D

Table A-13. 2016 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment D

Equipment/Phase	Source	FUEL	HP	Load Factor	Emission Factors									Emissions										
					ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day
OFFROAD Equipment																								
Build Retaining Wall																								
Forklift	CalEEMod User's Guide, Appendix D, 2016 Rough-Terrain Forklift, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	83	0.4	0.0015	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	1	6	0.29	1.62	2.07	0.00	0.13	0.12	249.58	0.03	0.20
On-Road Certified Truck Emissions																								
Build Retaining Wall																								
2-ton Flatbed Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	2	5	0.04	0.49	1.62	0.00	0.01	0.01	160.41	0.00	0.15
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1621	0.0002	0.0006	0.000565652	16.0	0.0002	0.0154	1	10	0.04	0.49	1.62	0.00	0.01	0.01	160.41	0.00	0.15
Subtotal																								
Simultaneous Construction Equipment																0.38	2.60	5.31	0.01	0.14	0.13	570.39	0.03	0.50

Table A-14
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment D

Table A-14. 2016 Maximum Daily Construction Emissions, Construction Truck Trips, Segment D

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10			PM2.5			CO ₂	CH ₄	N ₂ O	Emissions, lbs/day											
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂
Build Retaining Wall																													
2-ton Flatbed Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.08917953	0.036633	0.003	0.0382198	504.2223	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	0.00	22.23	0.00	0.00
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	247.933	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.00	0.00	0.00	21.86	0.00	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	1	30	20	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	247.933	0.01416764	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.93	0.00	0.00
Water Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.08917953	0.036633	0.003	0.0382198	504.2223	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	0.00	33.35	0.00	0.00
Subtotal																		0.13	0.40	0.03	0.00	0.03	0.02	0.01	0.00	88.38	0.01	0.00	
Simultaneous Construction Trucks																		0.13	0.40	0.03	0.00	0.03	0.02	0.01	0.00	88.38	0.01	0.00	

Table A-15
 Construction and Operations Worker Commute Emission Calculations
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment D

Table A-15. 2016 Maximum Daily Construction Emissions, Worker Trips, Segment D

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				CO2		CH4		N2O		
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Segment D	Light-Duty Truck, catalyst	31	35	80	2.361162	31.42448	0.224936	1.8136819	0.057965	2.3946367	1.6219719	0.707095	0.16038404	0.71464703	0.004128	0.00571499	0.003216	0.0291986	0.008	0.03675	0.002961	0.0268842	0.002	0.01575	308.6379	448.54818	0.003278	0.02209593	0.01	0.00972228

EMFAC2011 emission factors for 2016

Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Segment D	Light-Duty Truck, catalyst	31	35	80	15.06	1.35	1.57	0.02	0.26	0.12	0.08	0.02	1718.13	0.02	0.05
Simultaneous Worker Trips		31			15.06	1.35	1.57	0.02	0.26	0.12	0.08	0.02	1718.13	0.02	0.05

Table A-16
Fugitive Dust Emission Calculations
Sycamore to Peñasquitos 230 kV Transmission Line Project
Segment D

Table A-16. 2016 Maximum Daily Construction Emissions, Fugitive Dust, Segment D

Build Retaining Wall

Earthmoving - Material Handling

Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G

$$E = [0.00112 \times \{ \{G/5\}^{1.3} / \{H/2\}^{1.4} \}] \times [I/J]$$

where

G = Mean wind speed in miles per hour

H = Moisture content of surface material

I = Pounds of overburden handled per day

J = lbs/ton, 2000

Assume 12 miles per hour daily maximum wind speed

Assume H = 2.0% moisture - unmitigated

Assume 61% control efficiency for watering 3 times/day

I = 15200 cubic yards x 1600 lbs/cubic yard = 12160

Assume earthmoving occurs over 14 days, maximum per day could be 10 x daily average

PM10

Unmitigated	Mitigated	Unit
30.359749	11.8403021	lbs/day
0.00126564	0.0004936	total tons

PM2.5

Unmitigated	Mitigated	Unit
6.37554728	2.48646344	lbs/day
0.00026578	0.000103656	total tons

$$E = [0.00112 \times \{ \{G/5\}^{1.3} / \{H/2\}^{1.4} \}] \times [I/J] =$$

NOTE: PM2.5 is assumed to be 21% of PM10 based on SCAQMD's Final –Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds (October 2006)

Table A-17
 Construction Heavy Equipment Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment A

Table A-17. 2017 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment A

Equipment/Phase	Source	Emission Factors											Emissions															
		FUEL	HP	Load Factor	ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day				
OFFROAD Equipment																												
Wire Stringing/Sagging/Clipping																												
Air Compressor	CalEEMod User's Guide, Appendix D, 2016 Air Compressor, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	78	0.48	0.0016	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	3	5	0.92	4.58	5.85	0.01	0.37	0.33	703.62	0.08	0.56				
Bulldozer	CalEEMod User's Guide, Appendix D, 2016 Rubber Tired Dozers, 251/500 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	255	0.4	0.0013	0.0057	0.0091	0.0000	0.0003	0.000294312	1.3	0.0001	0.0009	3	5	2.02	8.77	13.87	0.02	0.51	0.45	1916.92	0.18	1.32				
Crane	CalEEMod User's Guide, Appendix D, 2016 Cranes, 176/250 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	226	0.29	0.0010	0.0057	0.0091	0.0000	0.0003	0.000294312	1.3	0.0001	0.0009	3	5	0.96	5.64	8.92	0.01	0.33	0.29	1231.72	0.09	0.85				
Generator	CalEEMod User's Guide, Appendix D, 2016 Generators, 26/50 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	50	0.74	0.0025	0.0082	0.0117	0.0000	0.0007	0.000588624	1.3	0.0001	0.0011	3	10	2.80	9.05	13.02	0.01	0.73	0.65	1390.71	0.13	1.24				
Wire Puller	CalEEMod User's Guide, Appendix D, 2016 Other Construction Equipment, 121/175 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	171	0.42	0.0009	0.0082	0.0091	0.0000	0.0005	0.000431658	1.3	0.0001	0.0009	3	5	0.92	8.79	9.77	0.01	0.52	0.47	1349.74	0.08	0.93				
Wire Tensioner	CalEEMod User's Guide, Appendix D, 2016 Other Construction Equipment, 121/175 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	171	0.42	0.0009	0.0082	0.0091	0.0000	0.0005	0.000431658	1.3	0.0001	0.0009	3	5	0.92	8.79	9.77	0.01	0.52	0.47	1349.74	0.08	0.93				
On-Road Certified Truck Emissions																												
Wire Stringing/Sagging/Clipping																												
Aerial Bucket Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	9	3	0.12	1.32	4.13	0.00	0.01	0.01	427.86	0.01	0.39				
Line Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	3	5	0.06	0.73	2.30	0.00	0.01	0.01	237.70	0.00	0.22				
Mobile Fueling Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	3	1	0.01	0.15	0.46	0.00	0.00	0.00	47.54	0.00	0.04				
Semi Tractor with Trailer	EMFAC2011 emission factors, HHD idling	DIESEL	400	0.38	0.0135	0.0756	0.1230	0.0001	0.0003	0.000265501	15.0	0.0150	0.0117	6	10	0.81	4.54	7.38	0.01	0.02	0.02	899.69	0.90	0.70				
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	6	5	0.13	1.46	4.59	0.00	0.02	0.01	475.40	0.01	0.44				
Subtotal																												
Simultaneous Construction Equipment															9.68	53.81	80.06	0.10	3.04	2.71	10030.64	1.56	7.61					

Note: Equipment amounts tripled to account for three crews

Table A-18
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment A

Table A-18. 2017 Maximum Daily Construction Emissions, Construction Truck Trips, Segment A

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10			PM2.5			CO ₂	CH ₄	N ₂ O	Emissions, lbs/day										
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂	CH ₄	N ₂ O
Wire Stringing, Sagging, and Clipping																												
Pick-Up Trucks	Light Duty Truck 1, Diesel	12	30	20	0.292950056	0.476931	0.065210487	0.003186	0.053955	0.007999958	0.036749816	0.049638	0.00199999	0.01574992	247.933	0.014167636	0.01	0.16	0.25	0.03	0.00	0.05	0.04	0.03	0.01	131.18	0.01	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	3	30	20	0.292950056	0.476931	0.065210487	0.003186	0.053955	0.007999958	0.036749816	0.049638	0.00199999	0.01574992	247.933	0.014167636	0.01	0.04	0.06	0.01	0.00	0.01	0.01	0.01	0.00	32.80	0.00	0.00
Aerial Bucket Truck	Light Heavy Duty Truck, Diesel	9	30	20	0.824603222	3.072245	0.173432606	0.003186	0.039819	0.011999938	0.089179533	0.036633	0.002999985	0.038219796	504.2223	0.028812777	0.01	0.33	1.22	0.07	0.00	0.06	0.03	0.02	0.01	200.09	0.01	0.01
Line Truck	Light Heavy Duty Truck, Diesel	3	30	20	0.824603222	3.072245	0.173432606	0.003186	0.039819	0.011999938	0.089179533	0.036633	0.002999985	0.038219796	504.2223	0.028812777	0.01	0.11	0.41	0.02	0.00	0.02	0.01	0.01	0.00	66.70	0.00	0.00
Mobile Fueling Truck	Light Heavy Duty Truck, Diesel	3	30	30	0.824603222	3.072245	0.173432606	0.003186	0.039819	0.011999938	0.089179533	0.036633	0.002999985	0.038219796	504.2223	0.028812777	0.01	0.16	0.61	0.03	0.00	0.03	0.02	0.01	0.00	100.05	0.01	0.00
Tool Van	Light Duty Truck 1, Diesel	3	30	20	0.292950056	0.476931	0.065210487	0.003186	0.053955	0.007999958	0.036749816	0.049638	0.00199999	0.01574992	247.933	0.014167636	0.01	0.04	0.06	0.01	0.00	0.01	0.01	0.01	0.00	32.80	0.00	0.00
Semi Tractor with Trailer	Heavy Duty Truck, Diesel	3	30	60	1.111513533	5.183568	0.300386954	0.010712	0.069818	0.035999812	0.061739677	0.064233	0.008999953	0.026459862	1807.669	0.103295646	0.05	0.44	2.06	0.12	0.00	0.07	0.04	0.02	0.01	717.34	0.04	0.02
Water Truck	Light Heavy Duty Truck, Diesel	3	30	30	0.824603222	3.072245	0.173432606	0.003186	0.039819	0.011999938	0.089179533	0.036633	0.002999985	0.038219796	504.2223	0.028812777	0.01	0.16	0.61	0.03	0.00	0.03	0.02	0.01	0.00	100.05	0.01	0.00
Subtotal																		1.44	5.28	0.33	0.01	0.28	0.17	0.13	0.03	1381.00	0.08	0.04
Simultaneous Construction Trucks																		1.44	5.28	0.33	0.01	0.28	0.17	0.13	0.03	1381.00	0.08	0.04

Truck amounts tripled to account for 3 crews

Table A-19
 Construction and Operations Worker Commute Emission Calculations
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment A

Table A-19. 2017 Maximum Daily Construction Emissions, Worker Trips, Segment A

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				CO ₂		CH ₄		N ₂ O		
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Wire Stringing/Sagging/Clipping	Light-Duty Truck, catalyst	15	35	80	2.153834	31.4244799	0.205224	1.8136819	0.048784	2.3946367	1.6219719	0.707095	0.16038404	0.714647031	0.004128	0.005715	0.003035	0.0291986	0.008	0.03675	0.002803	0.02688417	0.002	0.01575	297.3955	448.548176	0.002832911	0.02209593	0.01	0.00972228

EMFAC2011 emission factors for 2016
 Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂	CH ₄	N ₂ O
Wire Stringing/Sagging/Clipping	Light-Duty Truck, catalyst	15	35	80	6.74	0.60	0.73	0.01	0.13	0.06	0.04	0.01	801.61	0.01	0.02
Simultaneous Worker Trips		15			6.74	0.60	0.73	0.01	0.13	0.06	0.04	0.01	801.61	0.01	0.02

Table A-20
 Construction Heavy Equipment Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment B

Table A-20. 2017 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment B

Equipment/Phase	Source	FUEL	HP	Load Factor	Emission Factors										Emissions									
					ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day
OFFROAD Equipment																								
Cable Pulling																								
Pulling Rig	CalEEMod User's Guide, Appendix D, 2016 Other Construction Equipment, 121/175 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	171	0.42	0.0009	0.0082	0.0091	0.0000	0.0005	0.000431658	1.3	0.0001	0.0009	4	6	1.47	14.06	15.63	0.02	0.84	0.74	2159.58	0.13	1.48
On-Road Certified Truck Emissions																								
Cable Pulling																								
Line Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	4	6	0.10	1.17	3.67	0.00	0.01	0.01	380.32	0.00	0.35
Assist Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	4	6	0.10	1.17	3.67	0.00	0.01	0.01	380.32	0.00	0.35
Splice and Termination																								
Splice Trailer (no emissions)																								
Line Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	4	6	0.10	1.17	3.67	0.00	0.01	0.01	380.32	0.00	0.35
Assist Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	4	6	0.10	1.17	3.67	0.00	0.01	0.01	380.32	0.00	0.35
Simultaneous Construction Equipment																1.88	18.74	30.33	0.04	0.89	0.79	3680.86	0.15	2.88

Equipment amounts tripled to account for three crews

Table A-21
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment B

Table A-21. 2017 Maximum Daily Construction Emissions, Construction Truck Trips, Segment B

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10		PM2.5			CO ₂	CH ₄	N ₂ O	Emissions, lbs/day											
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO ₂	CH ₄	N ₂ O
Cable Pulling																												
Pick-Up Trucks	Light Duty Truck 1, Diesel	6	30	20	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	247.933	0.01416764	0.01	0.08	0.13	0.02	0.00	0.03	0.02	0.02	0.00	65.59	0.00	0.00
Line Truck	Light Heavy Duty Truck, Diesel	4	30	20	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.08917953	0.036633	0.003	0.0382198	504.2223	0.02881278	0.01	0.15	0.54	0.03	0.00	0.02	0.01	0.01	0.00	88.93	0.01	0.00
Assist Truck	Light Heavy Duty Truck, Diesel	4	30	20	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.08917953	0.036633	0.003	0.0382198	504.2223	0.02881278	0.01	0.15	0.54	0.03	0.00	0.02	0.01	0.01	0.00	88.93	0.01	0.00
Subtotal																	0.37	1.21	0.08	0.00	0.08	0.05	0.04	0.01	243.45	0.01	0.01	
Splice and Termination																												
Pick-Up Trucks	Light Duty Truck 1, Diesel	8	30	20	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	247.933	0.01416764	0.01	0.10	0.17	0.02	0.00	0.03	0.02	0.02	0.01	87.46	0.00	0.00
Line Truck	Light Heavy Duty Truck, Diesel	4	30	20	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.08917953	0.036633	0.003	0.0382198	504.2223	0.02881278	0.01	0.15	0.54	0.03	0.00	0.02	0.01	0.01	0.00	88.93	0.01	0.00
Assist Truck	Light Heavy Duty Truck, Diesel	4	30	20	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.08917953	0.036633	0.003	0.0382198	504.2223	0.02881278	0.01	0.15	0.54	0.03	0.00	0.02	0.01	0.01	0.00	88.93	0.01	0.00
Subtotal																	0.39	1.25	0.08	0.00	0.08	0.05	0.04	0.01	265.32	0.02	0.01	
Simultaneous Construction Trucks																	0.76	2.46	0.16	0.00	0.16	0.10	0.08	0.02	508.77	0.03	0.01	

Truck amounts tripled to account for 3 crews

Table A-22. 2017 Maximum Daily Construction Emissions, Worker Trips, Segment B

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				CO2		CH4		N2O		
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Cable Pulling	Light-Duty Truck, catalyst	17	35	80	2.153833594	31.42447989	0.20522395	1.813681924	0.048783653	2.394636679	1.621971872	0.707094998	0.16038404	0.714647031	0.004127654	0.005714994	0.003035358	0.029198634	0.007999958	0.036749816	0.002803369	0.026884174	0.001999999	0.01574992	297.39552	448.5481762	0.0028329	0.022095932	0.01	0.009722282
Splice & Termination	Light-Duty Truck, catalyst	13	35	80	2.153833594	31.42447989	0.20522395	1.813681924	0.048783653	2.394636679	1.621971872	0.707094998	0.16038404	0.714647031	0.004127654	0.005714994	0.003035358	0.029198634	0.007999958	0.036749816	0.002803369	0.026884174	0.001999999	0.01574992	297.39552	448.5481762	0.0028329	0.022095932	0.01	0.009722282

EMFAC2011 emission factors for 2016
 Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Cable Pulling	Light-Duty Truck, catalyst	17	35	80	7.64	0.68	0.83	0.01	0.14	0.06	0.04	0.01	908.49	0.01	0.03
Splice & Termination	Light-Duty Truck, catalyst	13	35	80	5.84	0.52	0.64	0.01	0.11	0.05	0.03	0.01	694.73	0.01	0.02
Simultaneous Worker Trips		17			7.64	0.68	0.83	0.01	0.14	0.06	0.04	0.01	908.49	0.01	0.03

Table A-23
 Construction Heavy Equipment Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment D

Table A-23. 2017 Maximum Daily Construction Emissions, Construction Heavy Equipment Use, Segment D

Equipment/Phase	FUEL	HP	Load Factor	Emission Factors									Emissions											
				ROG (lb/bhp-hr)	CO (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	PM2.5 (lb/bhp-hr)	CO2 (lb/bhp-hr)	CH4 (lb/bhp-hr)	N2O (lb/bhp-hr)	No of Equipment	Hrs Per Day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	
OFFROAD Equipment																								
Steel Structure Assembly																								
Air Compressor																								
	CalEEMod User's Guide, Appendix D, 2016 Air Compressor, 51/120 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	78	0.48	0.0016	0.0082	0.0104	0.0000	0.0007	0.000588624	1.3	0.0001	0.0010	1	12	0.74	3.66	4.68	0.01	0.30	0.26	562.90	0.07	0.44
Crane	CalEEMod User's Guide, Appendix D, 2016 Cranes, 176/250 hp for ROG, SOx, CO2, and CH4; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	226	0.29	0.0010	0.0057	0.0091	0.0000	0.0003	0.000294312	1.3	0.0001	0.0009	2	12	1.54	9.02	14.26	0.02	0.52	0.46	1970.75	0.14	1.36
Generator	CalEEMod User's Guide, Appendix D, 2016 Generators, 26/50 hp; 70% Tier2/Tier3 emission factors from Table A-29 for CO, NOx, and PM.	DIESEL	50	0.74	0.0025	0.0082	0.0117	0.0000	0.0007	0.000588624	1.3	0.0001	0.0011	1	12	1.12	3.62	5.21	0.01	0.29	0.26	556.28	0.05	0.49
On-Road Certified Truck Emissions																								
Steel Hauling																								
Crane Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	2	12	0.10	1.17	3.67	0.00	0.01	0.01	380.32	0.00	0.35
Semi Tractor with Trailer	EMFAC2011 emission factors, HHDT idling	DIESEL	400	0.38	0.0135	0.0756	0.1230	0.0001	0.0003	0.000265501	15.0	0.0150	0.0117	2	12	0.32	1.82	2.95	0.00	0.01	0.01	359.88	0.36	0.28
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	1	6	0.03	0.29	0.92	0.00	0.00	0.00	95.08	0.00	0.09
Steel Structure Assembly																								
Line Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	1	2	0.01	0.10	0.31	0.00	0.00	0.00	31.69	0.00	0.03
Mobile Fueling Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	1	2	0.01	0.10	0.31	0.00	0.00	0.00	31.69	0.00	0.03
Water Truck	EMFAC2011 emission factors, MHDT idling	DIESEL	175	0.38	0.0043	0.0488	0.1531	0.0002	0.0005	0.000478907	15.8	0.0002	0.0145	1	12	0.05	0.59	1.84	0.00	0.01	0.01	190.16	0.00	0.17
Subtotal																								
Simultaneous Construction Equipment																3.91	20.36	34.15	0.04	1.14	1.02	4178.75	0.63	3.24

Equipment amounts tripled to account for three crews

Table A-24
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project
 Segment D

Table A-24. 2017 Maximum Daily Construction Emissions, Construction Truck Trips, Segment D

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SO _x	PM10			PM2.5			CO2	CH4	N2O	Emissions, lbs/day												
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4
Steel Hauling																														
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.008	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	21.86	0.00	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.008	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.01	0.01	0.00	21.86	0.00	0.00	
Crane Truck	Light Heavy Duty Truck, Diesel	2	30	20	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.0119999	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.07	0.27	0.02	0.00	0.01	0.01	0.01	0.00	44.47	0.00	0.00		
Semi Tractor with Trailer	Heavy Duty Truck, Diesel	2	30	60	1.111513533	5.1835677	0.30038695	0.0107118	0.069818	0.0359998	0.06173968	0.0642326	0.009	0.0264599	1807.6693	0.10329565	0.05	0.29	1.37	0.08	0.00	0.04	0.03	0.02	0.00	478.23	0.03	0.01		
Subtotal																	0.42	1.73	0.11	0.00	0.07	0.05	0.03	0.01	0.01	566.42	0.03	0.01		
Steel Structure Assembly																														
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.008	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.01	0.00	21.86	0.00	0.00		
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	2	30	20	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.008	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.03	0.04	0.01	0.00	0.01	0.01	0.01	0.00	21.86	0.00	0.00		
Line Truck	Light Heavy Duty Truck, Diesel	1	30	20	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.0119999	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.04	0.14	0.01	0.00	0.01	0.00	0.00	0.00	22.23	0.00	0.00		
Mobile Fueling Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.0119999	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	33.35	0.00	0.00		
Water Truck	Light Heavy Duty Truck, Diesel	1	30	30	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.0119999	0.08917953	0.0366331	0.003	0.0382198	504.22234	0.02881278	0.01	0.05	0.20	0.01	0.00	0.01	0.01	0.00	0.00	33.35	0.00	0.00		
Subtotal																	0.20	0.63	0.04	0.00	0.04	0.03	0.02	0.00	0.00	132.66	0.01	0.00		
Simultaneous Construction Trucks																	0.62	2.35	0.15	0.00	0.12	0.07	0.05	0.01	0.01	699.08	0.04	0.02		

Truck amounts tripled to account for 3 crews

Table A-25. 2017 Maximum Daily Construction Emissions, Worker Trips, Segment D

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				CO2		CH4		N2O		
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Steel Hauling	Light-Duty Truck, catalyst	9	35	80	2.153834	31.4244799	0.205224	1.8136819	0.048784	2.39463668	1.62197187	0.707094998	0.16038404	0.714647031	0.004128	0.00571499	0.003035	0.02919863	0.008	0.03675	0.002803	0.0268842	0.002	0.01575	297.3955	448.548176	0.002833	0.02209593	0.01	0.009722282

EMFAC2011 emission factors for 2016

Assume startup after 8 hours

Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Steel Hauling	Light-Duty Truck, catalyst	9	35	80	4.04	0.36	0.44	0.01	0.08	0.03	0.02	0.01	480.97	0.00	0.01
Simultaneous Worker Trips		9			4.04	0.36	0.44	0.01	0.08	0.03	0.02	0.01	480.97	0.00	0.01

Table A-26
Helicopter Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-26. Helicopter Emissions

SX-PQ Transmission Project

Helicopter Model	Engine	Assumed Engine	Operating Mode	Fuel Flow, kg/s	Time in Mode, min	Emission Incides, g/kg fuel					Emissions, lbs/mode					Cruise Mode Emission factor, lbs/hour				
						CO	VOC	NOx	Sox	PM	CO	VOC	NOx	SOx	PM	CO	VOC	NOx	SOx	PM
Hughes 500E	Allison 250-C20B/R	250B17B	Taxi Out	0.008154	19	2.199837	23.004097	2.199837	0.4	4.2	0.045081939	0.471430067	0.045081939	0.008197324	0.086071898					
			Takeoff	0.031642	10.4	6.599994	0.402675	6.599994	0.4	4.2	0.287295342	0.017528297	0.287295342	0.017411855	0.182824475					
			Climbout	0.028926	0.09	5.981142	0.408337	5.981142	0.4	4.2	0.002059694	0.000140617	0.002059694	0.000137746	0.001446332	1.373129585	0.093744575	1.373129585	0.091830596	0.964221257
			Approach	0.010516	10.05	2.200637	5.988767	2.200637	0.4	4.2	0.03076471	0.083722432	0.03076471	0.005591965	0.058715628					
			Taxi In	0.008154	7	2.199837	23.004097	2.199837	0.4	4.2	0.016609136	0.173684761	0.016609136	0.003020067	0.031710699					
			Total per LTO																	
SkyKing	Allison 250-C20B/R	250B17B	Taxi Out	0.018353	19	175.63	99.78	1.201	0.4	4.2	8.10115881	4.602480362	0.055397664	0.018450513	0.193730382					
			Takeoff	0.112337	1.5	8.787	2.123	7.088	0.4	4.2	0.195858528	0.047320776	0.157988534	0.008915831	0.093616231					
			Climbout	0.079	1.5	14	1.32	5.58	0.4	4.2	0.219449282	0.020690932	0.087466214	0.006269979	0.065834785	8.777971296	0.827637294	3.498648559	0.25079918	2.633391389
			Approach	0.018	9.719	178.175	101.213	1.207995	0.4	4.2	4.123145244	2.342168652	0.027954196	0.009256395	0.097192143					
			Taxi In	0.018353	7	2.199837	23.004097	2.199837	0.4	4.2	0.037383795	0.390929167	0.037383795	0.006797557	0.071374351					
			Total per LTO																	

* Fuel flow rates and EF's from Federal Aviation Administration, Emission and Dispersion Modeling System (EDMS)

* Time in mode based on default times in EDMS

Therefore

To calculate lbs/day

Component	Emissions (lb/day)				
	CO	HC	NOx	SOx	PM
LTO - light helicopter (Hughes 500)	0.382	0.747	0.382	0.034	0.361
LTO - heavy helicopter (SkyKing)	12.677	7.404	0.366	0.050	0.522
Installation/Demolition - light helicopter, 3 hrs cruise	4.119	0.281	4.119	0.275	2.893
Installation/Demolition - heavy helicopter, 3 hrs cruise	26.334	2.483	10.496	0.752	7.900
Total Light Helicopter	4.501	1.028	4.501	0.310	3.253
Total Heavy Helicopter	39.011	9.887	10.862	0.802	8.422
Total	43.512	10.914	15.363	1.112	11.675

* Installation/demolition is assumed to be 3 hours (180 minutes) per event at cruise mode factors, assume 2 heavy helicopters used during construction, 10 months, 25 days per month

* SOx and PM emissions are negligible

Table A-27
 Unmitigated Construction Emissions Summary
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-27. Maximum Daily Unmitigated Construction Emissions, Summary

2016	Maximum Daily Construction Emissions, lbs/day					
Segment A	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	1.50	10.04	19.69	0.02	0.68	0.60
Construction Truck Trips	0.22	0.95	3.50	0.01	0.27	0.13
Worker Trips	4.90	47.11	4.24	0.07	1.07	0.42
Helicopter	10.91	43.51	15.36	1.11	11.68	11.68
Fugitive Dust (Unmitigated)					25.04	5.26
Total	17.53	101.61	42.79	1.21	38.74	18.09
Segment B	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	7.70	47.16	62.89	0.08	3.56	3.17
Construction Truck Trips	0.93	3.56	15.87	0.03	0.96	0.43
Worker Trips	1.51	14.57	4.24	0.02	0.33	0.13
Fugitive Dust (Unmitigated)					15.10	3.17
Total	10.14	65.29	83.00	0.13	19.95	6.90
Segment C	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	2.90	14.55	20.20	0.03	0.94	0.84
Construction Truck Trips	0.06	0.24	0.95	0.00	0.06	0.03
Worker Trips	1.57	15.06	4.24	0.02	0.34	0.13
Fugitive Dust (Unmitigated)					61.77	12.97
Total	4.53	29.85	25.39	0.05	63.11	13.97
Segment D	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	0.38	2.60	5.31	0.01	0.14	0.13
Construction Truck Trips	0.03	0.13	0.40	0.00	0.03	0.02
Worker Trips	1.57	15.06	4.24	0.02	0.34	0.13
Fugitive Dust (Unmitigated)					30.36	6.38
Total	1.97	17.79	9.95	0.03	30.88	6.66
Maximum Daily Emissions, 2016	34.17	214.54	161.13	1.42	152.68	45.62
2017	Maximum Daily Construction Emissions, lbs/day					
Segment A	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	9.68	53.81	80.06	0.10	3.04	2.71
Construction Truck Trips	0.33	1.44	5.28	0.01	0.44	0.29
Worker Trips	0.73	6.74	0.60	0.01	0.17	0.06
Helicopter	1.03	4.50	4.50	0.31	3.25	3.25
Total	11.77	66.49	90.44	0.44	6.90	6.32
Segment B	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	1.88	18.74	30.33	0.04	0.89	0.79
Construction Truck Trips	0.16	0.76	2.46	0.00	0.26	0.17
Worker Trips	0.83	7.64	0.68	0.01	0.19	0.07
Total	2.88	27.14	33.48	0.05	1.33	1.04
Segment D	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	3.91	20.36	34.15	0.04	1.14	1.02
Construction Truck Trips	0.15	0.62	2.35	0.00	0.19	0.12
Worker Trips	0.44	4.04	0.36	0.01	0.10	0.04
Total	4.50	25.02	36.86	0.05	1.43	1.18
Maximum Daily Emissions, 2017	19.15	118.65	160.78	0.55	9.66	8.53

Table A-28
Mitigated Construction Emissions Summary
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-28. Maximum Daily Mitigated Construction Emissions, Summary

2016	Maximum Daily Construction Emissions, lbs/day					
Segment A	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	1.50	10.04	19.69	0.02	0.68	0.60
Construction Truck Trips	0.22	0.95	3.50	0.01	0.27	0.13
Worker Trips	4.90	47.11	4.24	0.07	1.07	0.42
Helicopter	10.91	43.51	15.36	1.11	11.68	11.68
Fugitive Dust (Mitigated)					9.77	2.05
Total	17.53	101.61	42.79	1.21	23.46	14.88
Segment B	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	7.70	47.16	62.89	0.08	3.56	3.17
Construction Truck Trips	0.93	3.56	15.87	0.03	0.96	0.43
Worker Trips	1.51	14.57	4.24	0.02	0.33	0.13
Fugitive Dust (Mitigated)					5.89	1.24
Total	10.14	65.29	83.00	0.13	10.74	4.97
Segment C	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	2.90	14.55	20.20	0.03	0.94	0.84
Construction Truck Trips	0.06	0.24	0.95	0.00	0.06	0.03
Worker Trips	1.57	15.06	4.24	0.02	0.34	0.13
Fugitive Dust (Mitigated)					24.09	5.06
Total	4.53	29.85	25.39	0.05	25.43	6.06
Segment D	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	0.38	2.60	5.31	0.01	0.14	0.13
Construction Truck Trips	0.03	0.13	0.40	0.00	0.03	0.02
Worker Trips	1.57	15.06	4.24	0.02	0.34	0.13
Fugitive Dust (Mitigated)					11.84	2.49
Total	1.97	17.79	9.95	0.03	12.36	2.77
Maximum Daily Emissions, 2016	34.17	214.54	161.13	1.42	71.99	28.67

2017	Maximum Daily Construction Emissions, lbs/day					
Segment A	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	9.68	53.81	80.06	0.10	3.04	2.71
Construction Truck Trips	0.33	1.44	5.28	0.01	0.44	0.29
Worker Trips	0.73	6.74	0.60	0.01	0.17	0.06
Helicopter	1.03	4.50	4.50	0.31	3.25	3.25
Total	11.77	66.49	90.44	0.44	6.90	6.32
Segment B	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	1.88	18.74	30.33	0.04	0.89	0.79
Construction Truck Trips	0.16	0.76	2.46	0.00	0.26	0.17
Worker Trips	0.83	7.64	0.68	0.01	0.19	0.07
Total	2.88	27.14	33.48	0.05	1.33	1.04
Segment D	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	3.91	20.36	34.15	0.04	1.14	1.02
Construction Truck Trips	0.15	0.62	2.35	0.00	0.19	0.12
Worker Trips	0.44	4.04	0.36	0.01	0.10	0.04
Total	4.50	25.02	36.86	0.05	1.43	1.18
Maximum Daily Emissions, 2017	19.15	118.65	160.78	0.55	9.66	8.53

Table A-30
Construction Truck Trip Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-30. Total Emissions, Construction Truck Trips

		2016														Emissions, tons							
Vehicle	Vehicle Class	Number of equipment days used	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SOx	PM10		PM2.5			CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5		
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	CO	NOx	VOCs	SOx	PM10	PM2.5			
2-ton Flatbed Truck	Light Heavy Duty Truck, Dese	55	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Aerial Bucket Truck	Light Heavy Duty Truck, Dese	101	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Boom Truck	Light Heavy Duty Truck, Dese	18	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Concrete Trucks	Light Heavy Duty Truck, Dese	88	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Crane Truck	Light Heavy Duty Truck, Dese	89	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Drill Rig/Truck Mounted Auger	Light Heavy Duty Truck, Dese	46	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Dump Truck	Heavy Duty Truck, Diesel	1156	30	35.7	1.111513533	5.183568	0.30038695	0.010712	0.069818	0.03599981	0.06173968	0.064233	0.009	0.0264599	0.05	0.24	0.01	0.00	0.01	0.00	0.00	0.00	
Flatbed Boom Truck	Light Heavy Duty Truck, Dese	19	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Line Truck	Light Heavy Duty Truck, Dese	66	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Mobile Fueling Truck	Light Heavy Duty Truck, Dese	38	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Pick-Up Trucks	Light Duty Truck 1, Diesel	1244	30	35.7	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	532	30	35.7	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Tool Van	Light Duty Truck 1, Diesel	37	30	35.7	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Semi Tractor with Trailer	Heavy Duty Truck, Diesel	103	30	35.7	1.111513533	5.183568	0.30038695	0.010712	0.069818	0.03599981	0.06173968	0.064233	0.009	0.0264599	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	
Water Truck	Light Heavy Duty Truck, Dese	374	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	
Total														0.02	0.08	0.01		0.00	0.01	0.00	0.00	0.00	

		2017														Emissions, tons							
Vehicle	Vehicle Class	Number of equipment days used	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SOx	PM10		PM2.5			CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5		
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	CO	NOx	VOCs	SOx	PM10	PM2.5			
2-ton Flatbed Truck	Light Heavy Duty Truck, Dese	27	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Aerial Bucket Truck	Light Heavy Duty Truck, Dese	99	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Boom Truck	Light Heavy Duty Truck, Dese	18	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Concrete Trucks	Light Heavy Duty Truck, Dese	0	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Crane Truck	Light Heavy Duty Truck, Dese	22	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Drill Rig/Truck Mounted Auger	Light Heavy Duty Truck, Dese	3	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Dump Truck	Heavy Duty Truck, Diesel	520	30	35.7	1.111513533	5.183568	0.30038695	0.010712	0.069818	0.03599981	0.06173968	0.064233	0.009	0.0264599	0.02	0.11	0.01	0.00	0.00	0.00	0.00	0.00	
Flatbed Boom Truck	Light Heavy Duty Truck, Dese	12	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Line Truck	Light Heavy Duty Truck, Dese	101	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Mobile Fueling Truck	Light Heavy Duty Truck, Dese	135	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	
Pick-Up Trucks	Light Duty Truck 1, Diesel	2869	30	35.7	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	0.03	0.05	0.01	0.00	0.01	0.01	0.00	0.00	
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	1382	30	35.7	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	0.02	0.03	0.00	0.00	0.01	0.01	0.00	0.00	
Tool Van	Light Duty Truck 1, Diesel	293	30	35.7	0.292950056	0.476931	0.06521049	0.003186	0.053955	0.00799996	0.03674982	0.049638	0.002	0.0157499	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Semi Tractor with Trailer	Heavy Duty Truck, Diesel	192	30	35.7	1.111513533	5.183568	0.30038695	0.010712	0.069818	0.03599981	0.06173968	0.064233	0.009	0.0264599	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	
Water Truck	Light Heavy Duty Truck, Dese	343	30	35.7	0.824603222	3.072245	0.17343261	0.003186	0.039819	0.01199994	0.13033932	0.036633	0.003	0.0558597	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	
Total														0.04	0.11	0.01		0.00	0.01	0.00	0.00	0.00	

Paved Road Fugitive Dust
EPA's AP-42, Section 13.2.1, January 2011
E = k(SL/2)^{0.61} x (W/3)^{1.02}
For LDT assume 2 tons/vehicle, LHDT assume 13 tons/vehicle, HDT assume 20 tons/vehicle; therefore, average weight = 10.19 tons for 2016 and 5.52 tons for 2017
Assume silt loading for 10,000 ADT roadways = 0.03 g/m³
Assume k = 0.0022 PM10; 0.00054 PM2.5

Emission Factor
PM10 2016 0.000167625
PM2.5 2016 4.11444E-05
PM10 2017 8.96974E-05
PM2.5 2017 2.20166E-05

Table A-31. 2016 Construction Emissions, Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Days	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				
						Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)
All	Light-Duty Truck, catalyst	100	152	35	80	2.361162	31.42448	0.224936	1.8136819	0.057965	2.3946367	1.6219719	0.707095	0.16038404	0.71464703	0.004128	0.00571499	0.003216	0.0291986	0.008	0.03675	0.002961	0.0268842	0.002	0.01575

EMFAC2011 emission factors for 2016

Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Days	Speed (mph)	VMT (mi/vehicle-day)	Emissions, tons							
						CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5
All	Light-Duty Truck, catalyst	100	152	35	80	3.69	0.33	0.17	0.01	0.06	0.03	0.02	0.00
Total						3.69	0.33	0.17	0.01	0.06	0.03	0.02	0.00

Table A-32. 2017 Construction Emissions, Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Days	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG					SO _x		PM10				PM2.5				
						Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)
All	Light-Duty Truck, catalyst	100	107	35	80	2.153834	31.4244799	0.205224	1.8136819	0.048784	2.39463668	1.62197187	0.707094998	0.16038404	0.714647031	0.004128	0.00571499	0.003035	0.02919863	0.008	0.03675	0.002803	0.0268842	0.002	0.01575

EMFAC2011 emission factors for 2016

Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Days	Speed (mph)	VMT (mi/vehicle-day)	Emissions, tons							
						CO	NO _x	VOCs	SO _x	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5
All	Light-Duty Truck, catalyst	100	107	35	80	2.40	0.22	0.11	0.00	0.05	0.02	0.01	0.00
						2.40	0.22	0.11	0.00	0.05	0.02	0.01	0.00

Table A-33
 Unmitigated Construction Emissions Summary
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-33. Annual Unmitigated Construction Emissions, Summary

2016	Annual Construction Emissions, tons					
	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	0.53	3.98	5.47	0.01	0.28	0.25
Construction Truck Trips	0.01	0.02	0.08	0.00	0.01	0.00
Worker Trips	0.17	3.69	0.33	0.01	0.08	0.03
Helicopter	1.36	5.44	1.92	0.14	1.46	1.46
Fugitive Dust (Unmitigated)					0.82	0.17
Total	2.07	13.14	7.80	0.15	2.66	1.92

2017	Annual Construction Emissions, tons					
	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	0.74	5.95	7.31	0.01	0.48	0.43
Construction Truck Trips	0.01	0.04	0.11	0.00	0.01	0.01
Worker Trips	0.11	2.40	0.22	0.00	0.06	0.02
Helicopter	1.36	5.44	1.92	0.14	1.46	1.46
Total	2.23	13.83	9.56	0.15	2.02	1.92

Table A-34
 Mitigated Construction Emissions Summary
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-34. Annual Mitigated Construction Emissions, Summary

2016	Annual Construction Emissions, tons					
	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	0.53	3.98	5.47	0.01	0.28	0.25
Construction Truck Trips	0.01	0.02	0.08	0.00	0.01	0.00
Worker Trips	0.17	3.69	0.33	0.01	0.08	0.03
Helicopter	1.36	5.44	1.92	0.14	1.46	1.46
Fugitive Dust (Unmitigated)					0.31	0.07
Total	2.07	13.14	7.80	0.15	2.14	1.81

2017	Annual Construction Emissions, tons					
	ROG	CO	NOx	SOx	PM10	PM2.5
Construction Equipment	0.74	5.95	7.31	0.01	0.48	0.43
Construction Truck Trips	0.01	0.04	0.11	0.00	0.01	0.01
Worker Trips	0.11	2.40	0.22	0.00	0.06	0.02
Helicopter	1.36	5.44	1.92	0.14	1.46	1.46
Total	2.23	13.83	9.56	0.15	2.02	1.92

Table A-35
 ARB and USEPA Off-Road Engine Standards
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-35. ARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards (NMHC+NOx/CO/PM in g/bhp-hr). When ARB and USEPA standards differ, the standards shown here represent the more stringent of the two.

Maximum horsepower	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015+
<11	See Table 2 footnote (a)					7.8 / 6.0 / 0.75			5.6 / 6.0 / 0.6			5.6 / 6.0 / 0.30 ^a									
11@hp<25						7.1 / 4.9 / 0.60			5.6 / 4.9 / 0.60			5.6 / 4.9 / 0.30									
25@hp<50	-					7.1 / 4.1 / 0.60			5.6 / 4.1 / 0.45			5.6 / 4.1 / 0.22			3.5 / 4.1 / 0.02						
50@hp< 75									5.6 / 3.7 / 0.30			3.5 / 3.7 / 0.22 ^c			3.5 / 3.7 / 0.02 ^c						
75@hp<100						- / 6.9 / - / - ^b						3.5 / 3.7 / 0.30			0.14 / 2.5 / 3.7 / 0.015 ^{b,d}		0.14 / 0.30 / 3.7 / 0.015 ^b				
100@hp<175									4.9 / 3.7 / 0.22			3.0 / 3.7 / 0.22									
175@hp<300									4.9 / 2.6 / 0.15						0.14 / 2.5 / 3.7 / 0.015 ^{b,d}		0.14 / 0.30 / 3.7 / 0.015 ^b				
300@hp<600	-	1.0 / 6.9 / 8.5 / 0.40 ^b							4.8 / 2.6 / 0.15			3.0 / 2.6 / 0.15 ^e			0.14 / 1.5 / 2.6 / 0.015 ^{b,d}		0.14 / 0.30 / 2.2 / 0.015 ^b				
600@hp@750																					
Mobile Machines > 750hp															0.30 / 2.6 / 2.6 / 0.07 ^b		0.14 / 2.6 / 2.6 / 0.03 ^b				
750hp<GEN @1200hp						1.0 / 6.9 / 8.5 / 0.40 ^b						4.8 / 2.6 / 0.15					0.14 / 0.50 / 2.6 / 0.02 ^b				
GEN>1200 hp															0.30 / 0.50 / 2.6 / 0.07 ^b		0.14 / 0.50 / 2.6 / 0.02 ^b				

- a) The PM standard for hand-start, air cooled, direct injection engines below 11 hp may be delayed until 2010 and be set at 0.45 g/bhp-hr.
- b) Standards given are NMHC/NOx/CO/PM in g/bhp-hr.
- c) Engine families in this power category may alternately meet Tier 3 PM standards (0.30 g/bhp-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.
- d) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.
- e) Certain manufacturers have agreed to comply with these standards by 2005.



Table A-35
 ARB and USEPA Off-Road Engine Standards
 Sycamore to Peñasquitos 230 kV Transmission Line Project

	TIER 2 Emission Factors					
	NOx		CO		PM	
	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr
Maximum horsepower						
<11	5.32	0.0117284	6	0.0132275	0.6	0.0013228
11@hp<25	5.32	0.0117284	4.9	0.0108025	0.6	0.0013228
25@hp<50	5.32	0.0117284	4.1	0.0090388	0.45	0.0009921
50@hp< 75	5.32	0.0117284	3.7	0.008157	0.3	0.0006614
75@hp<100	5.32	0.0117284	3.7	0.008157	0.3	0.0006614
100@hp<175	4.655	0.0102623	3.7	0.008157	0.22	0.000485
175@hp<300	4.655	0.0102623	2.6	0.0057319	0.15	0.0003307
300@hp<600	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
600@hp@750	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
Mobile Machines > 750hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
750hp<GEN @1200hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
GEN>1200 hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307

TIER 3 Emission Factors					
NOx		CO		PM	
g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr
5.32	0.0117284	6	0.0132275	0.6	0.0013228
5.32	0.0117284	4.9	0.0108025	0.6	0.0013228
5.32	0.0117284	4.1	0.0090388	0.45	0.0009921
5.32	0.0117284	3.7	0.008157	0.3	0.0006614
3.325	0.0073302	3.7	0.008157	0.3	0.0006614
2.85	0.0062831	3.7	0.008157	0.22	0.000485
2.85	0.0062831	2.6	0.0057319	0.15	0.0003307
2.85	0.0062831	2.6	0.0057319	0.15	0.0003307
2.85	0.0062831	2.6	0.0057319	0.15	0.0003307
4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
4.56	0.0100529	2.6	0.0057319	0.15	0.0003307

Composite Emission Factors - 70% Tier 2, 30% Tier 3		
NOx	CO	PM
lb/bhp-hr	lb/bhp-hr	lb/bhp-hr
0.011728395	0.013227513	0.001323
0.011728395	0.010802469	0.001323
0.011728395	0.009038801	0.000992
0.011728395	0.008156966	0.000661
0.010408951	0.008156966	0.000661
0.009068563	0.008156966	0.000485
0.009068563	0.005731922	0.000331
0.008921958	0.005731922	0.000331
0.008921958	0.005731922	0.000331
0.01005291	0.005731922	0.000331
0.01005291	0.005731922	0.000331
0.01005291	0.005731922	0.000331
0.01005291	0.005731922	0.000331

% reduction from TIER 2 to TIER 3		
NOx	CO	PM
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
37.50%	0.00%	0.00%
38.78%	0.00%	0.00%
38.78%	0.00%	0.00%
37.50%	0.00%	0.00%
37.50%	0.00%	0.00%
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%

 : Tier 2

 : Tier 3

Table A-36
Operational Truck Trip Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-36. Operational Truck Trips

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO	NO _x	ROG	SOx	PM10			PM2.5			CO2	CH4	N2O	Emissions, lbs/day										
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Operations																												
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	60	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.00799996	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.08	0.13	0.02	0.00	0.03	0.02	0.01	0.00	65.59	0.00	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	2	30	60	0.292950056	0.4769309	0.06521049	0.0031861	0.0539548	0.00799996	0.03674982	0.0496384	0.002	0.0157499	247.93302	0.01416764	0.01	0.08	0.13	0.02	0.00	0.03	0.02	0.01	0.00	65.59	0.00	0.00
Aerial Bucket Truck	Light Heavy Duty Truck, Diesel	2	30	60	0.824603222	3.0722446	0.17343261	0.0031861	0.0398185	0.01199994	0.0764396	0.0366331	0.003	0.0327598	504.22234	0.02881278	0.01	0.22	0.81	0.05	0.00	0.03	0.02	0.01	0.00	133.40	0.01	0.00
Subtotal																		0.37	1.07	0.08	0.00	0.09	0.05	0.03	0.01	264.58	0.02	0.01
Simultaneous Construction Trucks																												
																		0.37	1.07	0.08	0.00	0.09	0.05	0.03	0.01	264.58	0.02	0.01

Table A-37. Operational Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO _x		ROG				SO _x		PM ₁₀				PM _{2.5}				CO ₂		CH ₄		N ₂ O			
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Operations	Light-Duty Truck, catalyst	9	35	80	2.153834	31.42448	0.205224	1.8136819	0.048784	2.39463668	1.62197187	0.707095	0.16038404	0.714647031	0.004128	0.00571499	0.003035	0.02919863	0.008	0.03675	0.002803	0.0268842	0.002	0.01575	297.3955	448.548176	0.002833	0.02209593	0.01	0.00972228

EMFAC2011 emission factors for 2016

Assume startup after 8 hours
 Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NO _x	VOCs	SO _x	PM ₁₀	PM _{2.5}	Paved Road Fugitive Dust PM ₁₀	Paved Road Fugitive Dust PM _{2.5}	CO ₂	CH ₄	N ₂ O
Operations	Light-Duty Truck, catalyst	9	35	80	4.04	0.36	0.19	0.01	0.08	0.03	0.02	0.01	480.97	0.00	0.01
Simultaneous Worker Trips		9			4.04	0.36	0.19	0.01	0.08	0.03	0.02	0.01	480.97	0.00	0.01

Table A-38
Operational Emissions Summary
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table A-38. Maximum Daily Operational Emissions, Summary

Source	Maximum Daily Operational Emissions, lbs/day					
	ROG	CO	NOx	SOx	PM10	PM2.5
Truck Trips	0.08	0.37	1.07	0.00	0.12	0.06
Worker Trips	0.19	4.04	0.36	0.01	0.10	0.04
Total	0.27	4.42	1.43	0.01	0.22	0.10

Table B-1
Construction Heavy Equipment GHG Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-1. Total GHG Emissions, Equipment

Equipment	Emission Factors						Emissions			
	FUEL	HP	Load Factor	CO2 (lb/bhp-hr or lbs/hr)	CH4 (lb/bhp-hr or lbs/hr)	N2O (lb/bhp-hr or lbs/hr)	Total Use (Hours)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)
Total Equipment Use										
2-ton Flatbed Truck	DIESEL	175	0.38	16.0	0.0002	0.0154	984	7.16	0.00	0.01
Aerial Bucket Truck	DIESEL	175	0.38	16.0	0.0002	0.0009	2400	17.46	0.00	0.00
Air Compressor	DIESEL	78	0.48	1.3	0.0001	0.0010	5560	118.30	0.01	0.09
Backhoe	DIESEL	97	0.37	1.3	0.0001	0.0010	2868	58.50	0.01	0.05
Boom Truck	DIESEL	175	0.38	16.0	0.0002	0.0154	420	3.06	0.00	0.00
Bulldozer	DIESEL	255	0.4	1.3	0.0001	0.0009	2628	152.34	0.01	0.10
Concrete Saw	DIESEL	81	0.73	1.3	0.0001	0.0010	340	11.43	0.00	0.01
Concrete Trucks	DIESEL	175	0.38	16.0	0.0002	0.0154	2406	17.51	0.00	0.02
Crane Truck	DIESEL	175	0.38	16.0	0.0002	0.0154	1338	9.74	0.00	0.01
Crane	DIESEL	226	0.29	1.3	0.0001	0.0009	3030	112.86	0.01	0.08
Drill Rig	DIESEL	82	0.5	1.3	0.0002	0.0010	580	13.51	0.00	0.01
Dump/Haul Truck	DIESEL	400	0.38	15.0	0.0006	0.0125	20105	136.75	0.01	0.11
Flatbed Boom Truck	DIESEL	175	0.38	16.0	0.0002	0.0154	378	2.75	0.00	0.00
Forklift	DIESEL	83	0.4	1.3	0.0001	0.0010	3420	64.53	0.01	0.05
Grader	DIESEL	174	0.41	1.3	0.0001	0.0009	1479	59.96	0.01	0.04
Hydraulic Rock Splitter/Rock Drilling Equipment	DIESEL	82	0.5	1.3	0.0002	0.0010	112	2.61	0.00	0.00
Line Truck	DIESEL	175	0.38	16.0	0.0001	0.0009	4228	30.76	0.00	0.00
Loader	DIESEL	97	0.37	1.3	0.0001	0.0010	1000	20.40	0.00	0.02
Mobile Fueling Truck	DIESEL	175	0.38	16.0	0.0001	0.0009	2068	15.05	0.00	0.00
Mower	DIESEL	25	0.42	1.3	0.0001	0.0011	1933	11.53	0.00	0.01
Paving Rig	DIESEL	82	0.36	1.3	0.0002	0.0010	300	5.03	0.00	0.00
Generator	DIESEL	50	0.74	1.3	0.0001	0.0011	12830	269.78	0.02	0.24
Skid-Steer Loader	DIESEL	78	0.37	1.3	0.0001	0.0010	500	8.20	0.00	0.01
Wire Puller	DIESEL	171	0.42	1.3	0.0001	0.0009	1850	75.51	0.00	0.05
Wire Tensioner	DIESEL	171	0.42	1.3	0.0001	0.0009	1080	44.08	0.00	0.03
Tool Van	DIESEL	175	0.38	16.0	0.0002	0.0154	3960	28.81	0.00	0.03
Semi Tractor with Trailer	DIESEL	400	0.38	15.0	0.0150	0.0125	3450	23.47	0.02	0.02
Water Truck	DIESEL	175	0.38	16.0	0.0002	0.0154	8606	62.62	0.00	0.06
Total								1383.70	0.13	1.06

Table B-2
Construction and Operational Truck Trip GHG Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-2. Total GHG Emissions, Construction Truck Trips

Vehicle	Vehicle Class	Number of days used	Speed (mph)	VMT (mi/vehicle-day)	CO2	CH4	N2O	Emissions, metric tons		
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO2	CH4	N2O
2-ton Flatbed Truck	Light Heavy Duty Truck, Diesel	82	30	20	504.222339	0.02881278	0.01	0.83	0.00	0.00
Aerial Bucket Truck	Light Heavy Duty Truck, Diesel	200	30	20	504.222339	0.02881278	0.01	2.02	0.00	0.00
Boom Truck	Light Heavy Duty Truck, Diesel	35	30	20	504.222339	0.02881278	0.01	0.35	0.00	0.00
Concrete Trucks	Light Heavy Duty Truck, Diesel	223	30	30	504.222339	0.02881278	0.01	3.37	0.00	0.00
Crane Truck	Light Heavy Duty Truck, Diesel	111.5	30	20	504.222339	0.02881278	0.01	1.12	0.00	0.00
Drill Rig/Truck Mounted Auger	Light Heavy Duty Truck, Diesel	48.3	30	20	504.222339	0.02881278	0.01	0.49	0.00	0.00
Dump Truck	Heavy Duty Truck, Diesel	1950.4	30	60	1807.66928	0.10329565	0.05	211.54	0.01	0.01
Flatbed Boom Truck	Light Heavy Duty Truck, Diesel	31.5	30	20	504.222339	0.02881278	0.01	0.32	0.00	0.00
Line Truck	Light Heavy Duty Truck, Diesel	384.3	30	20	504.222339	0.02881278	0.01	3.88	0.00	0.00
Mobile Fueling Truck	Light Heavy Duty Truck, Diesel	172.3	30	30	504.222339	0.02881278	0.01	2.61	0.00	0.00
Pick-Up Trucks	Light Duty Truck 1, Diesel	5091.7	30	20	247.933018	0.01416764	0.01	25.25	0.00	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	1914.4	30	20	247.933018	0.01416764	0.01	9.49	0.00	0.00
Tool Van	Light Duty Truck 1, Diesel	330	30	20	247.933018	0.01416764	0.01	1.64	0.00	0.00
Semi Tractor with Trailer	Heavy Duty Truck, Diesel	295	30	60	1807.66928	0.10329565	0.05	32.00	0.00	0.00
Water Truck	Light Heavy Duty Truck, Diesel	717.2	30	30	504.222339	0.02881278	0.01	10.85	0.00	0.00
Total								305.75	0.02	0.01

Table B-3
 Construction and Operations Worker Commute GHG Emission Calculations
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-3. Total GHG Emissions, Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Number of Days	Speed (mph)	VMT (mi/vehicle- day)	CO2		CH4		N2O	
						Running Exhaust (g/mi)	Start-Up (g/vehicle- day)	Running Exhaust (g/mi)	Start-Up (g/vehicle- day)	Running Exhaust (g/mi)	Start-Up (g/vehicle- day)
All	Light-Duty Truck, catalyst	100	166	35	80	297.39552	448.5481762	0.0028329	0.02209593	0.0085373	0.00972228

EMFAC2011 emission factors for 2016

Assume startup after 8 hours

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Number of Days	Speed (mph)	VMT (mi/vehicle- day)			
						CO2	CH4	N2O
All	Light-Duty Truck, catalyst	100	166	35	80	402.39	0.00	0.01
Total Worker Trips						402.39	0.00	0.01

Table B-4
Helicopter GHG Emissions
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-4. Helicopter Emissions

Helicopter Model	Engine	Assumed Engine	Operating Mode	Fuel Flow (kg/s)	Time in Mode (min)	Emission Incides, g/kg fuel					Emissions, lbs/mode				Cruise Mode Emission factor, lbs/hour			
						CO	VOC	NOx	Sox	PM	CO	VOC	NOx	PM	CO	VOC	NOx	PM
Hughes 500E	Allison 250-C20B/R	250B17B	Taxi Out	0.008154	19	2.199837	23.004097	2.199837	1.292	4.2	0.045081939	0.471430067	0.045081939	0.086071898				
			Takeoff	0.031642	10.4	6.599994	0.402675	6.599994	1.292	4.2	0.287295342	0.017528297	0.287295342	0.182824475				
			Climbout	0.028926	0.09	5.981142	0.408337	5.981142	1.292	4.2	0.002059694	0.000140617	0.002059694	0.001446332	1.373129585	0.093744575	1.373129585	0.964221257
			Approach	0.010516	10.05	2.200637	5.988767	2.200637	1.292	4.2	0.03076471	0.083722432	0.03076471	0.058715628				
			Taxi In	0.008154	7	2.199837	23.004097	2.199837	1.292	4.2	0.016609136	0.173684761	0.016609136	0.031710699				
			Total per LTO										0.381810822	0.746506173	0.381810822	0.360769031		
SkyKing	Allison 250-C20B/R	250B17B	Taxi Out	0.018353	19	175.63	99.78	1.201	1.292	4.2	8.10115881	4.602480362	0.055397664	0.193730382				
			Takeoff	0.112337	1.5	8.787	2.123	7.088	1.292	4.2	0.195858528	0.047320776	0.157988534	0.093616231				
			Climbout	0.079	1.5	14	1.32	5.58	1.292	4.2	0.219449282	0.020690932	0.087466214	0.065834785	8.777971296	0.827637294	3.498648559	2.633391389
			Approach	0.018	9.719	178.175	101.213	1.207995	1.292	4.2	4.123145244	2.342168652	0.027954196	0.097192143				
			Taxi In	0.018353	7	2.199837	23.004097	2.199837	1.292	4.2	0.037383795	0.390929167	0.037383795	0.071374351				
			Total per LTO										12.67699566	7.403589889	0.366190403	0.521747891		

* Fuel flow rates and EF's from Federal Aviation Administration, Emission and Dispersion Modeling System (EDMS)

* Time in mode based on default times in EDMS

Therefore

To calculate lbs/day

Component	Emissions (lb/day)			
	CO	HC	NOx	PM
LTO - light helicopter (Hughes 500)	0.382	0.747	0.382	0.361
LTO - heavy helicopter (SkyKing)	12.677	7.404	0.366	0.522
Installation/Demolition - light helicopter, 3 hrs cruise	4.119	0.281	4.119	2.893
Installation/Demolition - heavy helicopter, 3 hrs cruise	26.334	2.483	10.496	7.900
Total Light Helicopter	4.501	1.028	4.501	3.253
Total Heavy Helicopter	39.011	9.887	10.862	8.422
Total	43.512	10.914	15.363	11.675

* Installation/demolition is assumed to be 3 hours (180 minutes) per event at cruise mode factors

* SOx and PM emissions are negligible

Helicopter GHG Emission Estimates

Table of Factors and Constants

Value Units	Description
6.84 lb/gallon	Jet Fuel Density (at 15 degrees C) -- equivalent to 820 kg/m ³
142 lb/hr	Jet Fuel Usage at Idle
20.8 gallon/hr	Calculated Usage at Idle
679 lb/hr	Jet Fuel Usage at Climbout/Approach
99.3 gallon/hr	Calculated Usage at Climbout/Approach
9.57 kg CO ₂ /gallon	CO ₂ emission factor for Jet fuel
0.31 g N ₂ O/gallon	N ₂ O emission factor for Jet fuel
0.27 g CH ₄ /gallon	CH ₄ emission factor for Jet fuel

* Fuel usage rates from EPA AP-42, Table II-1-8, Modal Emission Rates - Military Aircraft Engines

* Fuel density from Air BP Handbook of Products - © Air BP Ltd. 2000

* Emission factors from California Climate Action Registry's General Reporting Protocol 3.1

GHG Emissions

Component	Time in mode (hrs)	Emissions (tonnes/day)				Days of Operation	Emissions (total tonnes)			
		CO ₂	N ₂ O	CH ₄	CO ₂ e		CO ₂	N ₂ O	CH ₄	CO ₂ e
Light Helicopter										
LTO - Idle	0.433	0.086	0.000013	0.000012	0.090	250	21.523	0.0033	0.0003	22.564
LTO - Other	0.342	0.068	0.000011	0.000009	0.071		17.003	0.0026	0.0003	17.826
Installation	3.000	0.596	0.000092	0.000080	0.626		149.007	0.0231	0.0024	156.212
Heavy Helicopter										
LTO - Idle	0.433	0.086	0.000013	0.000012	0.090	250	21.523	0.0033	0.0003	22.564
LTO - Other	0.212	0.042	0.000007	0.000006	0.044		10.529	0.0016	0.0002	11.038
Installation	3.000	0.596	0.000092	0.000080	0.626		149.007	0.0231	0.0024	156.212
Total per Installation	7.421	1.474	0.000228	0.000199	1.549338		368.592	0.0571	0.0060	386.416

* Jet Fuel usage was based on fuel usage time spent in approach, idle, and takeoff for each LTO and 3 hours for installation

Table B-5
 Total GHG Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-5. Total GHG Emissions, metric tons

	Total Construction Emissions, metric tons		
	CO2	CH4	N2O
Construction Equipment	1383.70	0.13	1.06
Construction Truck Trips	305.75	0.02	0.01
Worker Trips	402.39	0.00	0.01
Helicopter	368.59	0.06	0.01
Total	2460.43	0.20	1.08

2800.613

Table B-6
ARB and USEPA Off-Road Engine Standards
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-6. ARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards (NMHC+NOx/CO/PM in g/bhp-hr). When ARB and USEPA standards differ, the standards shown here represent the more stringent of the two.

Maximum horsepower	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015+
<11	See Table 2 footnote (a)					7.8 / 6.0 / 0.75			5.6 / 6.0 / 0.6			5.6 / 6.0 / 0.30 ^a									
11hp<25						7.1 / 4.9 / 0.60			5.6 / 4.9 / 0.60			5.6 / 4.9 / 0.30									
25hp<50	-					7.1 / 4.1 / 0.60			5.6 / 4.1 / 0.45			5.6 / 4.1 / 0.22			3.5 / 4.1 / 0.02						
50hp<75									5.6 / 3.7 / 0.30			3.5 / 3.7 / 0.22 ^c			3.5 / 3.7 / 0.02 ^c						
75hp<100						- / 6.9 / - / - ^b						3.5 / 3.7 / 0.30		0.14 / 2.5 / 3.7 / 0.015 ^{b,d}		0.14 / 0.30 / 3.7 / 0.015 ^b					
100hp<175							4.9 / 3.7 / 0.22			3.0 / 3.7 / 0.22											
175hp<300									4.9 / 2.6 / 0.15					0.14 / 1.5 / 2.6 / 0.015 ^{b,d}		0.14 / 0.30 / 2.2 / 0.015 ^b					
300hp<600	-	1.0 / 6.9 / 8.5 / 0.40 ^b				4.8 / 2.6 / 0.15			3.0 / 2.6 / 0.15 ^e			0.14 / 1.5 / 2.6 / 0.015 ^{b,d}		0.14 / 0.30 / 2.2 / 0.015 ^b							
600hp<750																					
Mobile Machines > 750hp																0.30 / 2.6 / 2.6 / 0.07 ^b	0.14 / 2.6 / 2.6 / 0.03 ^b				
750hp<GEN <1200hp						1.0 / 6.9 / 8.5 / 0.40 ^b					4.8 / 2.6 / 0.15					0.30 / 2.6 / 2.6 / 0.07 ^b	0.14 / 0.50 / 2.6 / 0.02 ^b				
GEN>1200 hp																0.30 / 0.50 / 2.6 / 0.07 ^b					

- a) The PM standard for hand-start, air cooled, direct injection engines below 11 hp may be delayed until 2010 and be set at 0.45 g/bhp-hr.
- b) Standards given are NMHC/NOx/CO/PM in g/bhp-hr.
- c) Engine families in this power category may alternately meet Tier 3 PM standards (0.30 g/bhp-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.
- d) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.
- e) Certain manufacturers have agreed to comply with these standards by 2005.



Table B-6
 ARB and USEPA Off-Road Engine Standards
 Sycamore to Peñasquitos 230 kV Transmission Line Project

	TIER 2 Emission Factors						TIER 3 Emission Factors						Composite Emission Factors - 70% Tier 2, 30% Tier 3			% reduction from TIER 2 to TIER 3		
	NOx		CO		PM		NOx		CO		PM		NOx	CO	PM	NOx	CO	PM
	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	lb/bhp-hr	lb/bhp-hr	lb/bhp-hr			
Maximum horsepower																		
<11	5.32	0.0117284	6	0.0132275	0.6	0.0013228	5.32	0.0117284	6	0.0132275	0.6	0.0013228	0.011728395	0.013227513	0.001323	0.00%	0.00%	0.00%
11@hp<25	5.32	0.0117284	4.9	0.0108025	0.6	0.0013228	5.32	0.0117284	4.9	0.0108025	0.6	0.0013228	0.011728395	0.010802469	0.001323	0.00%	0.00%	0.00%
25@hp<50	5.32	0.0117284	4.1	0.0090388	0.45	0.0009921	5.32	0.0117284	4.1	0.0090388	0.45	0.0009921	0.011728395	0.009038801	0.000992	0.00%	0.00%	0.00%
50@hp<75	5.32	0.0117284	3.7	0.008157	0.3	0.0006614	5.32	0.0117284	3.7	0.008157	0.3	0.0006614	0.011728395	0.008156966	0.000661	0.00%	0.00%	0.00%
75@hp<100	5.32	0.0117284	3.7	0.008157	0.3	0.0006614	3.325	0.0073302	3.7	0.008157	0.3	0.0006614	0.010408951	0.008156966	0.000661	37.50%	0.00%	0.00%
100@hp<175	4.655	0.0102623	3.7	0.008157	0.22	0.000485	2.85	0.0062831	3.7	0.008157	0.22	0.000485	0.009068563	0.008156966	0.000485	38.78%	0.00%	0.00%
175@hp<300	4.655	0.0102623	2.6	0.0057319	0.15	0.0003307	2.85	0.0062831	2.6	0.0057319	0.15	0.0003307	0.009068563	0.005731922	0.000331	38.78%	0.00%	0.00%
300@hp<600	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	2.85	0.0062831	2.6	0.0057319	0.15	0.0003307	0.008921958	0.005731922	0.000331	37.50%	0.00%	0.00%
600@hp@750	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	2.85	0.0062831	2.6	0.0057319	0.15	0.0003307	0.008921958	0.005731922	0.000331	37.50%	0.00%	0.00%
Mobile Machines > 750hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	0.01005291	0.005731922	0.000331	0.00%	0.00%	0.00%
750hp<GEN @1200hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	0.01005291	0.005731922	0.000331	0.00%	0.00%	0.00%
GEN>1200 hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307	0.01005291	0.005731922	0.000331	0.00%	0.00%	0.00%

 : Tier 2

 : Tier 3

Table B-7
 Construction and Operational Truck Trip Emissions
 Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-7. Operational Truck Trips

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO2	CH4	N2O	Emissions, lbs/day		
					Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO2	CH4	N2O
Operations										
Pick-Up Trucks	Light Duty Truck 1, Diesel	2	30	60	247.933018	0.01416764	0.01	65.59	0.00	0.00
Pick-Up Trucks, Crew Cab	Light Duty Truck 1, Diesel	2	30	60	247.933018	0.01416764	0.01	65.59	0.00	0.00
Aerial Bucket Truck	Light Heavy Duty Truck, Diesel	2	30	60	504.2223392	0.02881278	0.01	133.40	0.01	0.00
Subtotal								264.58	0.02	0.01
Operations										
								264.58	0.02	0.01

Table B-8. Operational Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Operations	Light-Duty Truck, catalyst	9	35	80	297.3955	448.548176	0.002833	0.02209593	0.01	0.00972228

EMFAC2011 emission factors for 2016

Assume startup after 8 hours

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day			Total GHG Emissions, metric tons/year		
					CO2	CH4	N2O	CO2	CH4	N2O
Operations	Light-Duty Truck, catalyst	9	35	80	480.97	0.00	0.01	2.62	0.00	0.00
Worker Trips		9	-	-	480.97	0.00	0.01	2.62	0.00	0.00

Table B-9
Operation GHG Emissions Summary
Sycamore to Peñasquitos 230 kV Transmission Line Project

Table B-9. Operational GHG Emissions, Summary

Source	Operational Emissions, metric tons/year			
	CO2	CH4	N2O	CO2e
Truck Trips	1.44	0.00	0.00	1.45
Worker Trips	2.62	0.00	0.00	2.64
Total	4.06	0.00	0.00	4.10