

APPENDIX 4

AIR QUALITY EMISSION DATA

The following pages present the Air Quality Emission Data.

Table 1: Emissions Associated with Commuting Construction Workers

Los Banos-Gates 500 kV Transmission Project

Vehicle Type	Vehicle Trips per Day	Days per Year	Round trip Miles	ROC		NOx		SOx		CO		PM10	
				Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)
Workers Commuting (LDGV)	55.0	261.0	30	2.77	2627.53	1.82	6.61	0.05	0.18	18.43	66.98	0.11	0.40
Workers Commuting (LDGT)	55.0	261.0	30	3.84	13.96	2.42	8.80	0.05	0.18	27.83	101.14	0.11	0.40
Total Emissions (lbs/year)					2641.49		15.41		0.36		168.13		0.80
Total Emissions (tons/year)					1.32		0.01		0.00		0.08		0.00

Notes: Emission factors for ROC, NOx, and CO obtained from Appendix J of AP-42 (USEPA, 1998)

Emission factors for ROC, NOx, and CO assumes 35 mph at 75 F; year 2000

Emission factors for PM10 and SOx obtained from Appendix 9 of CEQA Handbook (SCAQMD, 1993)

Workers commuting are divided into half Light Duty Gasoline Vehicles (LDGV) and half Light Duty Gasoline Trucks (LDGT). It is assumed that a total of 110 workers would commute to the work site each day. Workers would commute to the job sites 5 days a week for a total of 261 days a year.

Parameter	Units	Grader	Dozer	Backhoe	Parameter	Units	Water Truck	Haul Truck	
Number of Equipment Units		2	2	2	Miles per trip		100	5	
Operational Hours	hr/day	10	10	10	Trips per day		2	16	
Days per Year	day/year	43	43	43	days per year		43	43	
Average Rated Horse Power	hp	156.6	356	79	Conversion Factor	(lb/g)	0.002205	0.002205	
Typical Load Factor	%	57.50%	59.00%	46.50%					
Emission Factor	lb/hp-hr				Emission Factor	(g/mile)			
	CO	0.008	0.01	0.015	CO		6.42	6.42	
	ROCs	0.003	0.002	0.003	ROCs		1.34	1.34	
	NOx	0.021	0.021	0.022	NOx		9.27	9.27	
	SOx	0.002	0.002	0.002	SOx		0.30	0.30	
	PM10	0.001	0.0005	0.001	PM10		0.43	0.43	
Total Daily Emissions	(lb/year)								Totals (tons)
	CO	619.510	1806.344	473.882			121.742	48.697	1.535
	ROCs	232.316	361.269	94.776			25.410	10.164	0.362
	NOx	1626.213	3793.322	695.026			175.787	70.315	3.180
	SOx	154.877	361.269	63.184			5.689	2.276	0.294
	PM10	77.439	90.317	31.592			8.154	3.262	0.105

Assumptions:

43 days = ten months of five-day weeks

Approximately 2 haul trips per tower location would be required (assuming 337 towers)

Water truck would drive back and forth between two construction spreads twice a day (assuming spreads are 50 miles apart)

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L SCAQMD CEQA Air Quality Handbook

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Table 3: Mobile Source Emission Estimates for Tower Construction

Parameter	Units	Loader	Backhoe	Drill Rig	Parameter	Units	Haul Truck
Number of Equipment Units		2	2	2	Miles per trip		50
Operational Hours	hr/day	10	10	10	Trips per day		8
Days per Year	day/year	214	214	214	days per year		214
Average Rated Horse Power	hp	147	79	209	Conversion Factor	(lb/g)	0.002205
Typical Load Factor	%	46.50%	46.50%	75.00%			
Emission Factor	lb/hp-hr				Emission Factor	(g/mile)	
	CO	0.011	0.015	0.02	CO		6.42
	ROCs	0.002	0.003	0.003	ROCs		1.34
	NOx	0.023	0.022	0.024	NOx		9.27
	SOx	0.002	0.002	0.002	SOx		0.30
	PM10	0.0015	0.001	0.0015	PM10		0.43
Total Daily Emissions	(lb/year)						Totals (tons)
	CO	3218.153	2358.387	13417.800		1211.762	10.103
	ROCs	585.119	471.677	2012.670		252.922	1.661
	NOx	6728.866	3458.968	16101.360		1749.694	14.019
	SOx	585.119	314.452	1341.780		56.624	1.149
	PM10	438.839	157.226	1006.335		81.162	0.842

Assumptions:

214 days = ten months of five-day weeks

Aproximatley 5 haul trips would be required per tower location (assuming 337 towers, a tower every 1,300 feet for 83 miles).

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

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Table 4: Mobile Source Emission Estimates for Transmission Line Assembly

Parameter	Units	Dozer	Crane	Parameter	Units	Utility Truck
Number of Equipment Units		2	4	Miles per trip		50
Operational Hours	hr/day	10	10	Trips per day		4
Days per Year	day/year	43	43	days per year		43
Average Rated Horse Power	hp	356	194	Conversion Factor	(lb/g)	0.002205
Typical Load Factor	%	59.00%	43.00%	Emission Factor	(g/mile)	
Emission Factor	lb/hp-hr			CO		27.83
		0.01	0.009	ROCs		3.84
		0.002	0.003	NOx		2.42
		0.021	0.023	SOx		0.05
		0.002	0.002	PM10		0.11
		0.0005	0.0015			
Total Daily Emissions	(lb/year)					Totals (tons)
		1806.344	1291.342		527.740	1.813
		361.269	430.447		72.818	0.432
		3793.322	3300.095		45.890	3.570
		361.269	286.965		0.948	0.325
		90.317	215.224		2.086	0.154

Assumptions:

43 days = ten months of five-day weeks

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

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Table 5: Mobile Source Emission Estimates for Substation Improvements

Parameter	Units	Excavator	Dozer	Crane	Parameter	Units	Haul Truck
Number of Equipment Units		2	2	2	Miles per trip		50
Operational Hours	hr/day	10	10	10	Trips per day		2
Days per Year	day/year	64	64	64	days per year		64
Average Rated Horse Power	hp	151.7	356	194	Conversion Factor	(lb/g)	0.002205
Typical Load Factor	%	58.00%	59.00%	43.00%			
Emission Factor	lb/hp-hr				Emission Factor	(g/mile)	
	CO	0.011	0.01	0.009	CO		6.42
	ROCs	0.001	0.002	0.003	ROCs		1.34
	NOx	0.024	0.021	0.023	NOx		9.27
	SOx	0.002	0.002	0.002	SOx		0.30
	PM10	0.0015	0.0005	0.0015	PM10		0.43
Total Daily Emissions	(lb/year)						Totals (tons)
	CO	1238.843	2688.512	960.998		90.599	2.489
	ROCs	112.622	537.702	320.333		18.910	0.495
	NOx	2702.930	5645.875	2455.885		130.818	5.468
	SOx	225.244	537.702	213.555		4.234	0.490
	PM10	168.933	134.426	160.166		6.068	0.235

Assumptions:

64 days = Three months of five-day weeks

Approximately 130 haul trips would be required

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

Appendix J of AP-42, USEPA AP-42