Appendix B

Daily Emission Estimates in the South Coast Air Quality Management District

Table AQ-1a: TRENCHING SPREAD SCENARIO as in PEA

Parameter	Units	Asphalt Paver	Roller	Windrow Elevator	Grinder	Backhoe	Other Sources		Haul Trucks	Autos	Fugitive Dust	
Number of Equipment Units		1	1	1	1	2	Miles per round trip		10	30		
Operational Hours	(hr/day)	3	1	1	1	6	Trips per day		12	20		
Average Rated Horse Power	(hp)	80	78	80	500	78	Conversion Factor	(lb/g)	0.002205	0.002205		
Typical Load Factor	%	59.00%	57.50%	53.00%	53.00%	46.50%						
Emission Factor	(g/hp-hr)						Emission Factor	(g/trip)				
CO		3.2	3.2	4.5	4.5	5.0	CO		144.30	183.30		
ROCs		0.5	0.9	0.9	0.9	0.9	ROCs		22.40	16.40		
NOx		9.3	8.1	9.8	9.8	9.3	NOx		124.00	19.90		
SOx		0.9	0.9	0.9	0.9	0.9	SOx		4.00	0.30		
PM10		0.5	0.5	0.5	0.5	0.7	PM10		15.80	21.30		
Spread Total Daily Emissions	(lb/day)							(lb/day)				**Spread Total**
CO		1.00	0.32	0.42	2.63	4.80	CO		3.82	8.08		21.1
ROCs		0.16	0.09	0.08	0.53	0.86	ROCs		0.59	0.72		3.0
NOx		2.90	0.80	0.92	5.73	8.93	NOx		3.28	0.88		23.4
SOx		0.28	0.09	0.08	0.53	0.86	SOx		0.11	0.01		2.0
PM10		0.16	0.05	0.05	0.29	0.67	PM10		0.42	0.94	0.08	2.7

Table AQ-1b: BORING SPREAD SCENARIO as in PEA

Parameter	Units	Vacuum Trailer (g)	Drilling Machine	Backhoe	Mini-Excavator		Other Sources		Water Truck	Autos	Fugitive Dust	
Number of Equipment Units		1	1	1	1		Miles per round trip		1	30		
Operational Hours	(hr/day)	6	8	4	4		Trips per day		1	16		
Average Rated Horse Power	(hp)	30	70	78	17.4		Conversion Factor	(lb/g)	0.002205	0.002205		
Typical Load Factor	%	56.00%	75.00%	46.50%	58.00%							
Emission Factor	(g/hp-hr)						Emission Factor	(g/trip)				
CO		258.8	9.1	5.0	5.0		CO		169.30	183.30		
ROCs		11.4	1.4	0.9	0.5		ROCs		18.70	16.40		
NOx		5.0	9.8	9.3	9.8		NOx		82.80	19.90		
SOx		0.2	0.9	0.9	0.9		SOx		0.30	0.30		
PM10		0.0	0.7	0.7	0.7		PM10		3.40	21.30		
Spread Total Daily Emissions	(lb/day)							(lb/day)				**Spread Total**
CO		57.52	8.43	1.60	0.45		CO		0.37	6.47		74.8
ROCs		2.53	1.30	0.29	0.04		ROCs		0.04	0.58		4.8
NOx		1.11	9.08	2.98	0.87		NOx		0.18	0.70		14.9
SOx		0.04	0.83	0.29	0.08		SOx		0.00	0.01		1.3
PM10		0.00	0.65	0.22	0.06		PM10		0.01	0.75	0.00	1.7

(g) = gasoline powered equipment, all others diesel

Table AQ-1c: SIMULTANEOUS SPREADS as in PEA

		Trenching (per crew)	Boring (per crew)	Trenching Total	Boring Total	LA Basin Total Emissions	SCAQMD Threshold
Number of Spreads in Action				6	4	10	
Spread Total Daily Emissions	(lb/day)						
CO		21.1	74.8	126.4	299.3	425.7	550.0
ROCs		3.0	4.8	18.2	19.1	37.3	75.0
NOx		23.4	14.9	140.6	59.7	**200.3**	**100.0**
SOx		2.0	1.3	11.8	5.0	16.8	150.0
PM10		2.7	1.7	15.9	6.8	22.7	150.0

Sources:

Equipment Use Projection: Looking Glass Networks, PEA, May 2002 Appendix F

Emission Factors used in PEA: Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook* , 1993

Emission Factors used in PEA: Appendix J of AP-42, USEPA AP-42, 1991

Table AQ-2a: TRENCHING SPREAD SCENARIO with all Equipment Model Year 1988 or newer

Parameter	Units	Asphalt Paver	Roller	Windrow Elevator	Grinder	Backhoe	Other Sources		Haul Trucks	Autos	Fugitive Dust	
Number of Equipment Units		1	1	1	1	2	Miles per round trip		10	30		
Operational Hours	(hr/day)	3	1	1	1	6	Trips per day		12	20		
Average Rated Horse Power	(hp)	80	78	80	500	78	Conversion Factor	(lb/g)	0.002205	0.002205		
Typical Load Factor	%	59.00%	57.50%	53.00%	53.00%	46.50%						
Emission Factor	(g/hp-hr)						Emission Factor	(g/trip)				
CO		3.5	3.5	3.5	2.7	3.5	CO		144.30	183.30		
ROCs		1.0	1.0	1.0	0.7	1.0	ROCs		22.40	16.40		
NOx		8.8	8.8	8.8	8.2	8.8	NOx		124.00	19.90		
SOx		0.9	0.9	0.9	0.9	0.9	SOx		4.00	0.30		
PM10		0.7	0.7	0.7	0.4	0.7	PM10		15.80	21.30		
Spread Total Daily Emissions	(lb/day)							(lb/day)				**Spread Total**
CO		1.09	0.35	0.33	1.58	3.36	CO		3.82	8.08		18.6
ROCs		0.31	0.10	0.09	0.41	0.95	ROCs		0.59	0.72		3.2
NOx		2.73	0.87	0.82	4.77	8.40	NOx		3.28	0.88		21.7
SOx		0.28	0.09	0.08	0.53	0.86	SOx		0.11	0.01		2.0
PM10		0.22	0.07	0.07	0.22	0.67	PM10		0.42	0.94	0.08	2.7

Table AQ-2b: BORING SPREAD SCENARIO with all Equipment Model Year 1988 or newer

Parameter	Units	Vacuum Trailer (g)	Drilling Machine	Backhoe	Mini-Excavator		Other Sources		Water Truck	Autos	Fugitive Dust	
Number of Equipment Units		1	1	1	1		Miles per round trip		1	30		
Operational Hours	(hr/day)	6	8	4	4		Trips per day		1	16		
Average Rated Horse Power	(hp)	30	70	78	17.4		Conversion Factor	(lb/g)	0.002205	0.002205		
Typical Load Factor	%	56.00%	75.00%	46.50%	58.00%							
Emission Factor	(g/hp-hr)						Emission Factor	(g/trip)				
CO		258.8	3.5	3.5	5.0		CO		169.30	183.30		
ROCs		11.4	1.0	1.0	0.5		ROCs		18.70	16.40		
NOx		5.0	8.8	8.8	9.8		NOx		82.80	19.90		
SOx		0.2	0.9	0.9	0.9		SOx		0.30	0.30		
PM10		0.0	0.7	0.7	0.7		PM10		3.40	21.30		
Spread Total Daily Emissions	(lb/day)							(lb/day)				**Spread Total**
CO		57.52	3.24	1.12	0.45		CO		0.37	6.47		69.2
ROCs		2.53	0.92	0.32	0.04		ROCs		0.04	0.58		4.4
NOx		1.11	8.10	2.80	0.87		NOx		0.18	0.70		13.8
SOx		0.04	0.83	0.29	0.08		SOx		0.00	0.01		1.3
PM10		0.00	0.65	0.22	0.06		PM10		0.01	0.75	0.00	1.7

(g) = gasoline powered equipment, all others diesel

Table AQ-2c: SIMULTANEOUS SPREADS with all Equipment Model Year 1988 or newer

		Trenching (per crew)	Boring (per crew)	Trenching Total	Boring Total	LA Basin Total Emissions	SCAQMD Threshold
Number of Spreads in Action				3	2	5	
Spread Total Daily Emissions	(lb/day)						
CO		18.6	69.2	55.8	138.3	194.1	550.0
ROCs		3.2	4.4	9.5	8.9	18.4	75.0
NOx		21.7	13.8	65.2	27.5	92.8	100.0
SOx		2.0	1.3	5.9	2.5	8.4	150.0
PM10		2.7	1.7	8.1	3.4	11.4	150.0

Sources:

Equipment Use Projection: Looking Glass Networks, PEA, May 2002 Appendix F

Emission Factors (diesel): Post-1987 Factors. Table 12, California's Emissions Inventory for Off-Road Large Compression-Ignited Engines (>25hp), OFFROAD Model, January 2000

Emission Factors (others): as in PEA

Table AQ-3a: TRENCHING SPREAD SCENARIO with Equipment Compliant with 1996 Standards

Parameter	Units	Asphalt Paver	Roller	Windrow Elevator	Grinder	Backhoe	Other Sources		Haul Trucks	Autos	Fugitive Dust	
Number of Equipment Units		1	1	1	1	2	Miles per round trip		10	30		
Operational Hours	(hr/day)	3	1	1	1	6	Trips per day		12	20		
Average Rated Horse Power	(hp)	80	78	80	500	78	Conversion Factor	(lb/g)	0.002205	0.002205		
Typical Load Factor	%	59.00%	57.50%	53.00%	53.00%	46.50%						
Emission Factor	(g/hp-hr)						Emission Factor	(g/trip)				
CO		3.5	3.5	3.5	2.7	3.5	CO		144.30	183.30		
ROCs		1.0	1.0	1.0	0.7	1.0	ROCs		22.40	16.40		
NOx		6.9	6.9	6.9	6.9	6.9	NOx		124.00	19.90		
SOx		0.9	0.9	0.9	0.9	0.9	SOx		4.00	0.30		
PM10		0.7	0.7	0.7	0.4	0.7	PM10		15.80	21.30		
Spread Total Daily Emissions	(lb/day)							(lb/day)				**Spread Total**
CO		1.09	0.35	0.33	1.58	3.36	CO		3.82	8.08		18.6
ROCs		0.31	0.10	0.09	0.41	0.95	ROCs		0.59	0.72		3.2
NOx		2.15	0.68	0.65	4.03	6.62	NOx		3.28	0.88		18.3
SOx		0.28	0.09	0.08	0.53	0.86	SOx		0.11	0.01		2.0
PM10		0.22	0.07	0.07	0.22	0.67	PM10		0.42	0.94	0.08	2.7

Table AQ-3b: BORING SPREAD SCENARIO with Equipment Compliant with 1996 Standards

Parameter	Units	Vacuum Trailer (g)	Drilling Machine	Backhoe	Mini-Excavator		Other Sources		Water Truck	Autos	Fugitive Dust	
Number of Equipment Units		1	1	1	1		Miles per round trip		1	30		
Operational Hours	(hr/day)	6	8	4	4		Trips per day		1	16		
Average Rated Horse Power	(hp)	30	70	78	17.4		Conversion Factor	(lb/g)	0.002205	0.002205		
Typical Load Factor	%	56.00%	75.00%	46.50%	58.00%							
Emission Factor	(g/hp-hr)						Emission Factor	(g/trip)				
CO		258.8	3.5	3.5	5.0		CO		169.30	183.30		
ROCs		11.4	1.0	1.0	0.5		ROCs		18.70	16.40		
NOx		5.0	6.9	6.9	9.8		NOx		82.80	19.90		
SOx		0.2	0.9	0.9	0.9		SOx		0.30	0.30		
PM10		0.0	0.7	0.7	0.7		PM10		3.40	21.30		
Spread Total Daily Emissions	(lb/day)							(lb/day)				**Spread Total**
CO		57.52	3.24	1.12	0.45		CO		0.37	6.47		69.2
ROCs		2.53	0.92	0.32	0.04		ROCs		0.04	0.58		4.4
NOx		1.11	6.39	2.21	0.87		NOx		0.18	0.70		11.5
SOx		0.04	0.83	0.29	0.08		SOx		0.00	0.01		1.3
PM10		0.00	0.65	0.22	0.06		PM10		0.01	0.75	0.00	1.7

(g) = gasoline powered equipment, all others diesel

Table AQ-3c: SIMULTANEOUS SPREADS with Equipment Compliant with 1996 Standards

		Trenching (per crew)	Boring (per crew)	Trenching Total	Boring Total	LA Basin Total Emissions	SCAQMD Threshold
Number of Spreads in Action				4	2	6	
Spread Total Daily Emissions	(lb/day)						
CO		18.6	69.2	74.4	138.3	212.8	550.0
ROCs		3.2	4.4	12.7	8.9	21.6	75.0
NOx		18.3	11.5	73.2	22.9	96.1	100.0
SOx		2.0	1.3	7.9	2.5	10.4	150.0
PM10		2.7	1.7	10.7	3.4	14.1	150.0

Sources:

Equipment Use Projection: Looking Glass Networks, PEA, May 2002 Appendix F

Emission Factors (diesel): 1996 NOx Standards, U.S. EPA Tier I, with CARB OFFROAD Model Inventory, January

Emission Factors (others): as in PEA