

Title : Los Angeles County Subarea 2008 Winter  
Version : Emfac2002 V2.2 Sept 23 2002  
Run Date : 04/13/05 17:24:23  
Scen Year: 2008 -- Model Years: 1965 to 2008  
Season : Winter  
Area : Los Angeles (SC)  
I/M Stat : I and M program in effect  
Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline Trucks	Diesel Trucks	Total HD Trucks					
Vehicles	50765.	3464040.	11611.	3526410.	27401.	1485420.	13596.	1526420.	6468.	411075.	23181.	440724.	6231.	61743.	67975.	92073.	160048.	8301.	69138.	5731040.
VMT/1000	831.	119123.	276.	120230.	728.	51111.	454.	52293.	151.	14626.	1032.	15810.	62.	1321.	1383.	7982.	9365.	903.	495.	199096.
Trips	208782.	21707900.	63470.	21980100.	115257.	9305340.	84156.	9504750.	61568.	3942780.	233542.	4237890.	106475.	814556.	921030.	1414840.	2335870.	33203.	138262.	38230100.
Reactive Organic Gas Emissions																				
Run Exh	5.41	11.80	0.08	17.29	4.76	7.24	0.06	12.06	1.08	2.76	0.21	4.06	0.36	1.23	1.59	3.73	5.32	1.69	1.81	42.22
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.38	0.42	0.00	0.00	0.50
Start Ex	1.20	15.84	0.00	17.04	0.63	7.44	0.00	8.07	0.43	3.79	0.00	4.22	1.30	1.87	3.17	0.00	3.17	0.08	0.38	32.96
Total Ex	6.61	27.63	0.08	34.32	5.39	14.68	0.06	20.13	1.51	6.63	0.21	8.35	1.66	3.14	4.80	4.11	8.91	1.77	2.18	75.67
Diurnal	0.39	4.17	0.00	4.56	0.20	1.82	0.00	2.02	0.03	0.49	0.00	0.52	0.00	0.02	0.02	0.00	0.02	0.00	0.17	7.28
Hot Soak	0.91	5.17	0.00	6.07	0.51	2.30	0.00	2.81	0.11	0.80	0.00	0.90	0.08	0.12	0.19	0.00	0.19	0.01	0.10	10.10
Running	4.41	19.22	0.00	23.63	1.34	14.41	0.00	15.75	0.43	6.10	0.00	6.54	0.55	2.39	2.93	0.00	2.93	0.06	0.51	49.42
Resting	0.18	1.65	0.00	1.82	0.10	0.74	0.00	0.84	0.01	0.20	0.00	0.21	0.00	0.00	0.01	0.00	0.01	0.00	0.05	2.93
Total	12.49	57.84	0.08	70.41	7.54	33.95	0.06	41.56	2.09	14.22	0.21	16.52	2.29	5.67	7.96	4.11	12.07	1.84	3.01	145.41
Carbon Monoxide Emissions																				
Run Exh	64.11	385.88	0.24	450.24	55.83	255.50	0.30	311.63	17.20	70.81	0.80	88.81	11.07	26.22	37.29	17.94	55.23	13.64	22.34	941.89
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.43	0.01	0.46	0.03	0.22	0.25	2.28	2.53	0.00	0.00	2.99
Start Ex	6.86	174.73	0.00	181.59	3.78	93.56	0.00	97.34	2.94	42.30	0.00	45.23	12.09	30.19	42.28	0.00	42.28	1.03	1.45	368.91
Total Ex	70.97	560.61	0.24	631.82	59.60	349.06	0.30	408.97	20.14	113.55	0.81	134.50	23.19	56.63	79.83	20.21	100.04	14.67	23.79	1313.79
Oxides of Nitrogen Emissions																				
Run Exh	4.44	44.98	0.44	49.86	3.76	35.35	0.70	39.81	1.06	15.02	5.51	21.59	0.40	7.49	7.89	116.78	124.67	14.18	0.78	250.89
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.00	0.00	6.99	7.00	0.00	0.00	7.04
Start Ex	0.32	10.66	0.00	10.99	0.17	6.75	0.00	6.92	0.08	5.31	0.00	5.39	0.20	3.82	4.02	0.00	4.02	0.10	0.05	27.46
Total Ex	4.77	55.64	0.44	60.85	3.93	42.09	0.70	46.73	1.13	20.33	5.55	27.02	0.60	11.32	11.91	123.77	135.68	14.28	0.83	285.39
Carbon Dioxide Emissions (000)																				
Run Exh	0.45	47.83	0.11	48.39	0.40	25.19	0.17	25.76	0.10	9.89	0.54	10.52	0.04	0.85	0.89	17.37	18.26	1.87	0.07	104.87
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.36	0.36	0.00	0.00	0.38
Start Ex	0.05	1.77	0.00	1.81	0.03	0.93	0.00	0.95	0.01	0.38	0.00	0.40	0.02	0.03	0.06	0.00	0.06	0.00	0.01	3.23
Total Ex	0.50	49.60	0.11	50.21	0.42	26.11	0.17	26.71	0.11	10.29	0.54	10.94	0.06	0.89	0.96	17.72	18.68	1.87	0.08	108.48
PM10 Emissions																				
Run Exh	0.03	1.53	0.05	1.61	0.03	1.13	0.03	1.19	0.01	0.37	0.05	0.43	0.00	0.01	0.01	2.00	2.01	0.21	0.02	5.46
Idle Exh	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	0.15	0.15	0.00	0.00	0.15
Start Ex	0.00	0.16	0.00	0.17	0.00	0.11	0.00	0.11	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Total Ex	0.03	1.70	0.05	1.78	0.03	1.25	0.03	1.30	0.01	0.41	0.05	0.47	0.00	0.01	0.02	2.15	2.16	0.21	0.02	5.94
TireWear	0.01	1.05	0.00	1.06	0.01	0.45	0.00	0.46	0.00	0.14	0.01	0.15	0.00	0.02	0.02	0.25	0.27	0.01	0.00	1.96
BrakeWr	0.01	1.65	0.00	1.66	0.01	0.71	0.01	0.72	0.00	0.20	0.01	0.22	0.00	0.02	0.02	0.11	0.13	0.01	0.01	2.75
Total	0.05	4.40	0.05	4.50	0.04	2.40	0.04	2.49	0.01	0.75	0.08	0.84	0.00	0.05	0.05	2.51	2.56	0.23	0.03	10.65
Lead	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	0.00	0.00	0.00
Sox	0.01	0.49	0.00	0.49	0.01	0.26	0.00	0.26	0.00	0.10	0.01	0.11	0.00	0.01	0.01	0.17	0.18	0.02	0.00	1.06
Fuel Consumption (000 gallons)																				
Gasoline	64.80	5177.84	0.00	5242.64	54.85	2734.97	0.00	2789.82	15.05	1073.88	0.00	1088.92	10.88	101.35	112.23	0.00	112.23	36.30	12.38	9282.29
Diesel	0.00	0.00	10.01	10.01	0.00	0.00	15.66	15.66	0.00	0.00	48.41	48.41	0.00	0.00	0.00	1595.19	1595.19	138.28	0.00	1807.55

Title : Los Angeles County Avg 2009 Winter  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 04/12/05 10:22:24  
 Scen Year: 2009 -- Model Years: 1965 to 2009  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline Trucks	Diesel Trucks	Total HD Trucks					
Vehicles	43135.	3506920.	10276.	3560330.	23854.	1503820.	12958.	1540630.	5707.	415740.	23266.	444712.	5268.	62488.	67756.	93756.	161512.	8380.	69746.	5785300.
VMT/1000	693.	120386.	239.	121319.	631.	51543.	428.	52602.	134.	14703.	1020.	15857.	52.	1309.	1361.	8213.	9575.	912.	502.	200765.
Trips	175366.	21950600.	55205.	22181100.	99139.	9397560.	79776.	9576480.	52115.	3978280.	235664.	4266060.	93264.	805287.	898551.	1438490.	2337040.	33519.	139478.	38533700.
Reactive Organic Gas Emissions																				
Run Exh	4.52	10.58	0.07	15.17	4.13	6.78	0.06	10.97	0.98	2.59	0.21	3.78	0.30	1.11	1.41	3.54	4.95	1.66	1.76	38.29
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.39	0.43	0.00	0.00	0.50
Start Ex	1.01	14.50	0.00	15.51	0.54	7.03	0.00	7.57	0.36	3.64	0.00	3.99	1.13	1.78	2.90	0.00	2.90	0.08	0.37	30.42
Total Ex	5.52	25.08	0.07	30.67	4.68	13.81	0.06	18.54	1.34	6.30	0.21	7.85	1.43	2.93	4.36	3.93	8.28	1.74	2.13	69.21
Diurnal	0.33	3.97	0.00	4.29	0.18	1.78	0.00	1.96	0.02	0.48	0.00	0.51	0.00	0.02	0.02	0.00	0.02	0.00	0.16	6.95
Hot Soak	0.76	5.01	0.00	5.77	0.44	2.29	0.00	2.73	0.09	0.79	0.00	0.88	0.07	0.11	0.18	0.00	0.18	0.01	0.09	9.66
Running	3.68	17.97	0.00	21.65	1.13	14.36	0.00	15.48	0.36	6.13	0.00	6.49	0.48	2.42	2.90	0.00	2.90	0.06	0.45	47.03
Resting	0.15	1.65	0.00	1.80	0.08	0.76	0.00	0.85	0.01	0.21	0.00	0.22	0.00	0.00	0.01	0.00	0.01	0.00	0.05	2.92
Total	10.44	53.67	0.07	64.18	6.51	33.01	0.06	39.57	1.82	13.91	0.21	15.93	1.98	5.48	7.46	3.93	11.39	1.81	2.89	135.77
Carbon Monoxide Emissions																				
Run Exh	53.34	357.20	0.21	410.75	48.39	243.20	0.28	291.87	15.58	67.85	0.79	84.23	9.35	23.82	33.17	17.16	50.33	13.28	20.92	871.38
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.44	0.01	0.46	0.02	0.22	0.25	2.32	2.57	0.00	0.00	3.02
Start Ex	5.75	162.60	0.00	168.36	3.25	89.14	0.00	92.39	2.49	40.43	0.00	42.92	10.55	28.81	39.37	0.00	39.37	1.02	1.47	345.53
Total Ex	59.09	519.81	0.21	579.11	51.64	332.34	0.28	384.26	18.08	108.72	0.81	127.61	19.93	52.85	72.78	19.48	92.26	14.30	22.40	1219.94
Oxides of Nitrogen Emissions																				
Run Exh	3.71	40.85	0.38	44.93	3.26	33.21	0.67	37.13	0.96	14.16	5.24	20.35	0.34	6.76	7.09	109.51	116.60	14.03	0.77	233.82
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.00	0.00	7.12	7.12	0.00	0.00	7.17
Start Ex	0.27	10.00	0.00	10.27	0.15	6.49	0.00	6.64	0.07	5.31	0.00	5.38	0.17	3.64	3.81	0.00	3.81	0.10	0.05	26.25
Total Ex	3.98	50.85	0.38	55.21	3.41	39.70	0.67	43.77	1.02	19.47	5.28	25.77	0.51	10.40	10.91	116.62	127.53	14.14	0.82	267.24
Carbon Dioxide Emissions (000)																				
Run Exh	0.38	48.15	0.10	48.62	0.35	25.41	0.16	25.92	0.09	9.94	0.53	10.55	0.03	0.84	0.88	17.92	18.80	1.88	0.07	105.84
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.36	0.37	0.00	0.00	0.39
Start Ex	0.04	1.78	0.00	1.82	0.02	0.93	0.00	0.96	0.01	0.39	0.00	0.40	0.02	0.03	0.05	0.00	0.05	0.00	0.01	3.24
Total Ex	0.42	49.93	0.10	50.44	0.37	26.34	0.16	26.88	0.10	10.34	0.53	10.97	0.06	0.88	0.94	18.28	19.22	1.88	0.08	109.46
PM10 Emissions																				
Run Exh	0.02	1.55	0.04	1.62	0.02	1.18	0.03	1.23	0.00	0.38	0.05	0.44	0.00	0.01	0.01	1.91	1.92	0.21	0.02	5.43
Idle Exh	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	0.14	0.14	0.00	0.00	0.14
Start Ex	0.00	0.17	0.00	0.17	0.00	0.12	0.00	0.12	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Total Ex	0.03	1.72	0.04	1.79	0.02	1.30	0.03	1.35	0.01	0.43	0.05	0.48	0.00	0.01	0.01	2.05	2.06	0.21	0.02	5.91
TireWear	0.01	1.06	0.00	1.07	0.01	0.45	0.00	0.46	0.00	0.14	0.01	0.15	0.00	0.02	0.02	0.26	0.28	0.01	0.00	1.98
BrakeWr	0.01	1.66	0.00	1.68	0.01	0.71	0.01	0.73	0.00	0.20	0.01	0.22	0.00	0.02	0.02	0.11	0.13	0.01	0.01	2.78
Total	0.04	4.45	0.05	4.53	0.04	2.46	0.04	2.54	0.01	0.77	0.08	0.85	0.00	0.05	0.05	2.43	2.48	0.23	0.03	10.67
Lead	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	0.00	0.00	0.00
Sox	0.01	0.49	0.00	0.49	0.00	0.26	0.00	0.26	0.00	0.10	0.01	0.11	0.00	0.01	0.01	0.17	0.18	0.02	0.00	1.07
Fuel Consumption (000 gallons)																				
Gasoline	54.04	5204.03	0.00	5258.07	47.51	2755.58	0.00	2803.09	13.36	1078.02	0.00	1091.38	9.32	99.86	109.18	0.00	109.18	36.57	12.58	9310.87
Diesel	0.00	0.00	8.68	8.68	0.00	0.00	14.77	14.77	0.00	0.00	47.89	47.89	0.00	0.00	0.00	1645.35	1645.35	138.90	0.00	1855.59

Title : Los Angeles County Subarea 2010 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/13/05 09:37:23  
 Scen Year: 2010 -- Model Years: 1965 to 2010  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline Trucks	Diesel Trucks	Total HD Trucks					
Vehicles	35341.	3549770.	9063.	3594180.	20517.	1521890.	12343.	1554750.	5010.	420408.	23321.	448739.	4406.	63128.	67534.	95408.	162942.	8458.	70366.	5839440.
VMT/1000	560.	121646.	207.	122413.	540.	51991.	404.	52934.	118.	14783.	1008.	15908.	43.	1298.	1342.	8469.	9811.	920.	508.	202494.
Trips	142427.	22192200.	47804.	22382500.	84317.	9487660.	75552.	9647530.	44051.	4012720.	237614.	4294390.	80585.	794770.	875355.	1461470.	2336820.	33834.	140719.	38835700.
Reactive Organic Gas Emissions																				
Run Exh	3.63	9.52	0.06	13.22	3.54	6.37	0.05	9.96	0.88	2.43	0.20	3.51	0.25	0.99	1.24	3.32	4.56	1.65	1.72	34.61
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.04	0.04	0.40	0.43	0.00	0.00	0.51
Start Ex	0.81	13.25	0.00	14.06	0.46	6.62	0.00	7.08	0.30	3.48	0.00	3.78	0.95	1.68	2.63	0.00	2.63	0.08	0.37	27.99
Total Ex	4.44	22.77	0.06	27.27	4.00	12.98	0.05	17.04	1.18	5.98	0.20	7.36	1.20	2.71	3.91	3.71	7.62	1.73	2.09	63.11
Diurnal																				
Diurnal	0.27	3.77	0.00	4.04	0.15	1.75	0.00	1.90	0.02	0.48	0.00	0.50	0.00	0.02	0.02	0.00	0.02	0.00	0.16	6.62
Hot Soak	0.62	4.86	0.00	5.47	0.38	2.29	0.00	2.66	0.08	0.78	0.00	0.86	0.06	0.11	0.16	0.00	0.16	0.01	0.08	9.25
Running	2.95	16.85	0.00	19.79	0.92	14.23	0.00	15.15	0.29	6.15	0.00	6.44	0.41	2.44	2.85	0.00	2.85	0.06	0.41	44.70
Resting	0.12	1.65	0.00	1.77	0.07	0.79	0.00	0.86	0.01	0.21	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.91
Total	8.40	49.89	0.06	58.35	5.53	32.04	0.05	37.62	1.58	13.60	0.20	15.37	1.67	5.27	6.94	3.71	10.65	1.80	2.78	126.58
Carbon Monoxide Emissions																				
Run Exh	42.77	330.95	0.18	373.90	41.40	231.01	0.26	272.67	13.94	65.04	0.78	79.76	7.72	21.48	29.19	16.21	45.40	13.09	19.69	804.52
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.44	0.01	0.46	0.02	0.22	0.24	2.36	2.60	0.00	0.00	3.06
Start Ex	4.64	151.10	0.00	155.75	2.77	84.68	0.00	87.45	2.11	38.60	0.00	40.71	8.89	27.31	36.21	0.00	36.21	1.01	1.50	322.63
Total Ex	47.42	482.05	0.18	529.65	44.17	315.69	0.26	360.12	16.06	104.08	0.79	120.93	16.63	49.01	65.64	18.57	84.21	14.10	21.20	1130.21
Oxides of Nitrogen Emissions																				
Run Exh	2.99	37.14	0.33	40.46	2.79	31.16	0.63	34.58	0.86	13.33	4.86	19.04	0.27	6.04	6.31	99.22	105.53	13.95	0.77	214.34
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.00	0.00	7.24	7.24	0.00	0.00	7.29
Start Ex	0.22	9.33	0.00	9.55	0.13	6.21	0.00	6.34	0.06	5.28	0.00	5.34	0.14	3.45	3.59	0.00	3.59	0.10	0.05	24.96
Total Ex	3.21	46.47	0.33	50.00	2.92	37.37	0.63	40.92	0.91	18.62	4.90	24.43	0.41	9.49	9.90	106.45	116.36	14.06	0.82	246.59
Carbon Dioxide Emissions (000)																				
Run Exh	0.31	48.48	0.08	48.87	0.30	25.64	0.15	26.09	0.08	9.99	0.52	10.59	0.03	0.84	0.86	18.53	19.39	1.89	0.08	106.90
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.37	0.38	0.00	0.00	0.39
Start Ex	0.03	1.79	0.00	1.82	0.02	0.94	0.00	0.96	0.01	0.39	0.00	0.40	0.02	0.03	0.05	0.00	0.05	0.00	0.01	3.24
Total Ex	0.34	50.27	0.08	50.69	0.31	26.58	0.15	27.05	0.09	10.39	0.53	11.00	0.05	0.88	0.92	18.90	19.82	1.89	0.08	110.54
PM10 Emissions																				
Run Exh	0.02	1.58	0.03	1.63	0.02	1.22	0.03	1.27	0.00	0.40	0.05	0.45	0.00	0.01	0.01	1.77	1.78	0.21	0.02	5.35
Idle Exh	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	0.14	0.14	0.00	0.00	0.14
Start Ex	0.00	0.17	0.00	0.17	0.00	0.12	0.00	0.12	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Total Ex	0.02	1.74	0.03	1.80	0.02	1.34	0.03	1.39	0.00	0.44	0.05	0.49	0.00	0.01	0.01	1.91	1.92	0.21	0.02	5.83
TireWear	0.00	1.07	0.00	1.08	0.00	0.46	0.00	0.47	0.00	0.14	0.01	0.15	0.00	0.02	0.02	0.27	0.29	0.01	0.00	2.00
BrakeWr	0.01	1.68	0.00	1.69	0.01	0.72	0.01	0.73	0.00	0.20	0.01	0.22	0.00	0.02	0.02	0.12	0.14	0.01	0.01	2.80
Total	0.03	4.50	0.04	4.57	0.03	2.52	0.04	2.59	0.01	0.79	0.07	0.87	0.00	0.05	0.05	2.30	2.35	0.23	0.03	10.63
Lead	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	0.00	0.00	0.00
SOx	0.00	0.49	0.00	0.50	0.00	0.26	0.00	0.27	0.00	0.10	0.01	0.11	0.00	0.01	0.01	0.18	0.19	0.02	0.00	1.08
Fuel Consumption (000 gallons)																				
Gasoline	43.61	5232.21	0.00	5275.82	40.66	2776.83	0.00	2817.49	11.77	1082.50	0.00	1094.28	7.84	98.43	106.26	0.00	106.26	36.79	12.77	9343.40
Diesel	0.00	0.00	7.51	7.51	0.00	0.00	13.93	13.93	0.00	0.00	47.39	47.39	0.00	0.00	0.00	1700.66	1700.66	139.85	0.00	1909.34

Title : Los Angeles County Subarea 2011 Winter  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 04/12/05 16:36:04  
 Scen Year: 2011 -- Model Years: 1966 to 2011  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline Trucks	Diesel Trucks	Total HD Trucks					
Vehicles	28764.	3598820.	7953.	3635530.	17692.	1542600.	11722.	1572020.	4405.	425936.	23384.	453725.	3567.	63914.	67480.	97238.	164719.	8554.	71147.	5905690.
VMT/1000	449.	123180.	179.	123807.	463.	52570.	380.	53413.	104.	14902.	996.	16002.	35.	1295.	1330.	8765.	10095.	931.	514.	204762.
Trips	114895.	22474700.	41160.	22630800.	71833.	9595330.	71261.	9738420.	37618.	4055300.	239781.	4332700.	68274.	786818.	855092.	1487280.	2342380.	34216.	142281.	39220800.
Reactive Organic Gas Emissions																				
Run Exh	3.03	9.12	0.05	12.20	3.17	6.32	0.05	9.54	0.81	2.43	0.20	3.44	0.21	0.96	1.17	3.21	4.38	1.65	1.67	32.88
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.04	0.04	0.40	0.44	0.00	0.00	0.52
Start Ex	0.65	12.07	0.00	12.72	0.40	6.22	0.00	6.61	0.26	3.32	0.00	3.58	0.79	1.58	2.38	0.00	2.38	0.08	0.36	25.73
Total Ex	3.68	21.19	0.05	24.92	3.56	12.54	0.05	16.15	1.07	5.82	0.20	7.09	1.01	2.58	3.58	3.61	7.20	1.73	2.03	59.13
Diurnal	0.22	3.57	0.00	3.79	0.13	1.71	0.00	1.85	0.02	0.47	0.00	0.49	0.00	0.02	0.02	0.00	0.02	0.00	0.16	6.30
Hot Soak	0.49	4.71	0.00	5.21	0.32	2.28	0.00	2.60	0.07	0.77	0.00	0.84	0.05	0.10	0.15	0.00	0.15	0.01	0.08	8.88
Running	2.34	15.84	0.00	18.18	0.76	14.06	0.00	14.82	0.24	6.16	0.00	6.40	0.34	2.44	2.78	0.00	2.78	0.06	0.37	42.61
Resting	0.10	1.65	0.00	1.75	0.06	0.81	0.00	0.87	0.01	0.22	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.90
Total	6.84	46.96	0.05	53.85	4.84	31.40	0.05	36.29	1.40	13.45	0.20	15.05	1.40	5.13	6.53	3.61	10.14	1.81	2.68	119.82
Carbon Monoxide Emissions																				
Run Exh	34.40	314.76	0.16	349.32	35.81	224.69	0.25	260.75	12.52	63.80	0.78	77.10	6.29	19.83	26.11	15.75	41.87	12.96	17.91	759.91
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.44	0.01	0.46	0.02	0.22	0.24	2.40	2.64	0.00	0.00	3.10
Start Ex	3.74	140.11	0.00	143.85	2.37	80.24	0.00	82.61	1.81	36.82	0.00	38.62	7.26	25.88	33.14	0.00	33.14	1.01	1.53	300.77
Total Ex	38.14	454.87	0.16	493.17	38.18	304.93	0.25	343.36	14.33	101.05	0.80	116.18	13.56	45.93	59.49	18.16	77.65	13.97	19.44	1063.78
Oxides of Nitrogen Emissions																				
Run Exh	2.36	34.17	0.28	36.82	2.36	29.49	0.59	32.44	0.75	12.63	4.42	17.80	0.21	5.31	5.52	87.46	92.99	13.89	0.76	194.69
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	7.37	7.37	0.00	0.00	7.42
Start Ex	0.18	8.65	0.00	8.83	0.11	5.91	0.00	6.01	0.05	5.24	0.00	5.29	0.11	3.25	3.37	0.00	3.37	0.11	0.05	23.65
Total Ex	2.54	42.82	0.28	45.64	2.47	35.39	0.59	38.45	0.80	17.87	4.46	23.14	0.33	8.57	8.89	94.83	103.72	14.00	0.81	225.76
Carbon Dioxide Emissions (000)																				
Run Exh	0.25	50.21	0.07	50.53	0.26	26.60	0.15	27.01	0.07	10.33	0.52	10.92	0.02	0.85	0.88	19.23	20.11	1.90	0.08	110.55
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.01	0.37	0.38	0.00	0.00	0.40
Start Ex	0.03	1.81	0.00	1.83	0.02	0.95	0.00	0.97	0.01	0.39	0.00	0.40	0.02	0.03	0.05	0.00	0.05	0.00	0.01	3.26
Total Ex	0.28	52.01	0.07	52.36	0.28	27.56	0.15	27.98	0.08	10.74	0.52	11.34	0.04	0.89	0.93	19.60	20.54	1.91	0.09	114.21
PM10 Emissions																				
Run Exh	0.02	1.69	0.03	1.74	0.02	1.33	0.03	1.38	0.00	0.43	0.05	0.48	0.00	0.01	0.01	1.70	1.71	0.20	0.02	5.53
Idle Exh	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	0.13	0.13	0.00	0.00	0.13
Start Ex	0.00	0.17	0.00	0.17	0.00	0.12	0.00	0.12	0.00	0.04	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
Total Ex	0.02	1.86	0.03	1.91	0.02	1.46	0.03	1.50	0.00	0.48	0.05	0.53	0.00	0.01	0.01	1.83	1.84	0.20	0.02	6.01
TireWear	0.00	1.09	0.00	1.09	0.00	0.46	0.00	0.47	0.00	0.14	0.01	0.15	0.00	0.02	0.02	0.28	0.30	0.01	0.00	2.03
BrakeWr	0.01	1.70	0.00	1.71	0.01	0.73	0.01	0.74	0.00	0.21	0.01	0.22	0.00	0.02	0.02	0.12	0.14	0.01	0.01	2.83
Total	0.03	4.65	0.03	4.71	0.03	2.65	0.03	2.71	0.01	0.83	0.07	0.90	0.00	0.05	0.05	2.24	2.29	0.23	0.03	10.87
Lead	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	0.00	0.00	0.00
Sox	0.00	0.51	0.00	0.51	0.00	0.27	0.00	0.27	0.00	0.10	0.00	0.11	0.00	0.01	0.01	0.19	0.20	0.02	0.00	1.11
Fuel Consumption (000 gallons)																				
Gasoline	35.69	5405.85	0.00	5441.54	35.64	2874.88	0.00	2910.52	10.58	1117.49	0.00	1128.07	6.50	99.77	106.27	0.00	106.27	37.09	12.91	9636.41
Diesel	0.00	0.00	6.46	6.46	0.00	0.00	13.10	13.10	0.00	0.00	46.98	46.98	0.00	0.00	0.00	1764.24	1764.24	141.05	0.00	1971.82

Title : Los Angeles County Subarea 2012 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2012 -- Model Years: 1967 to 2012  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	23255.	3647490.	6961.	3677710.	15162.	1563500.	11124.	1589780.	3858.	431593.	23415.	458866.	2889.	64584.	67473.	99082.	166555.	8652.	71944.	5973510.
VMT/1000	357.	124692.	154.	125202.	395.	53174.	357.	53925.	91.	15029.	985.	16105.	28.	1292.	1320.	9042.	10363.	941.	521.	207058.
Trips	92029.	22754000.	35384.	22881500.	60825.	9704380.	67109.	9832310.	32096.	4099340.	241608.	4373050.	56516.	779868.	836383.	1513280.	2349670.	34606.	143874.	39615000.
Reactive Organic Gas Emissions																				
Run Exh	2.42	8.25	0.04	10.71	2.73	5.94	0.05	8.71	0.73	2.29	0.19	3.20	0.17	0.85	1.02	3.01	4.02	1.65	1.64	29.94
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.04	0.04	0.41	0.45	0.00	0.00	0.52
Start Ex	0.52	10.98	0.00	11.50	0.34	5.83	0.00	6.17	0.22	3.17	0.00	3.39	0.64	1.49	2.13	0.00	2.13	0.08	0.36	23.63
Total Ex	2.95	19.22	0.04	22.21	3.06	11.77	0.05	14.88	0.95	5.53	0.19	6.67	0.81	2.38	3.19	3.42	6.61	1.73	2.00	54.10
Diurnal	0.18	3.39	0.00	3.57	0.11	1.68	0.00	1.79	0.01	0.46	0.00	0.48	0.00	0.01	0.02	0.00	0.02	0.00	0.16	6.01
Hot Soak	0.39	4.57	0.00	4.96	0.27	2.27	0.00	2.54	0.06	0.77	0.00	0.82	0.04	0.09	0.13	0.00	0.13	0.01	0.07	8.53
Running	1.84	14.94	0.00	16.78	0.62	13.84	0.00	14.46	0.20	6.17	0.00	6.37	0.27	2.43	2.70	0.00	2.70	0.06	0.34	40.72
Resting	0.08	1.65	0.00	1.73	0.06	0.83	0.00	0.89	0.01	0.23	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.90
Total	5.45	43.76	0.04	49.26	4.12	30.39	0.05	34.55	1.22	13.16	0.19	14.57	1.13	4.92	6.05	3.42	9.46	1.80	2.62	112.27
Carbon Monoxide Emissions																				
Run Exh	27.34	291.50	0.14	318.98	30.66	213.17	0.24	244.07	11.11	61.02	0.77	72.89	4.94	17.82	22.76	14.99	37.75	12.69	17.06	703.44
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.02	0.46	0.02	0.22	0.24	2.45	2.68	0.00	0.00	3.14
Start Ex	2.99	129.73	0.00	132.72	2.01	75.87	0.00	77.88	1.55	35.10	0.00	36.65	5.71	24.51	30.22	0.00	30.22	1.01	1.56	280.04
Total Ex	30.33	421.23	0.14	451.70	32.67	289.04	0.24	321.95	12.66	96.56	0.78	110.00	10.66	42.55	53.21	17.44	70.65	13.71	18.62	986.63
Oxides of Nitrogen Emissions																				
Run Exh	1.88	31.15	0.24	33.27	2.02	27.62	0.55	30.19	0.67	11.86	4.08	16.61	0.16	4.73	4.89	78.49	83.39	13.72	0.76	177.95
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	7.51	7.51	0.00	0.00	7.56
Start Ex	0.14	7.97	0.00	8.12	0.09	5.59	0.00	5.68	0.04	5.19	0.00	5.23	0.09	3.06	3.15	0.00	3.15	0.11	0.05	22.34
Total Ex	2.02	39.12	0.24	41.39	2.11	33.21	0.55	35.88	0.71	17.06	4.12	21.90	0.25	7.80	8.05	86.00	94.05	13.83	0.81	207.85
Carbon Dioxide Emissions (000)																				
Run Exh	0.20	50.67	0.06	50.93	0.22	26.91	0.14	27.27	0.06	10.41	0.51	10.99	0.02	0.85	0.87	19.88	20.75	1.92	0.08	111.94
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.38	0.39	0.00	0.00	0.41
Start Ex	0.02	1.82	0.00	1.84	0.01	0.96	0.00	0.98	0.01	0.40	0.00	0.41	0.01	0.03	0.04	0.00	0.04	0.00	0.01	3.28
Total Ex	0.22	52.49	0.06	52.77	0.24	27.87	0.14	28.25	0.07	10.82	0.52	11.41	0.03	0.89	0.92	20.26	21.19	1.92	0.09	115.62
PM10 Emissions																				
Run Exh	0.01	1.71	0.03	1.75	0.01	1.37	0.02	1.41	0.00	0.45	0.04	0.49	0.00	0.01	0.01	1.58	1.59	0.20	0.02	5.47
Idle Exh	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	0.13	0.13	0.00	0.00	0.13
Start Ex	0.00	0.17	0.00	0.17	0.00	0.13	0.00	0.13	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
Total Ex	0.01	1.88	0.03	1.92	0.02	1.50	0.02	1.54	0.00	0.49	0.04	0.54	0.00	0.01	0.01	1.71	1.72	0.20	0.02	5.95
TireWear	0.00	1.10	0.00	1.10	0.00	0.47	0.00	0.48	0.00	0.14	0.01	0.16	0.00	0.02	0.02	0.29	0.31	0.01	0.00	2.06
BrakeWr	0.00	1.72	0.00	1.73	0.01	0.74	0.00	0.75	0.00	0.21	0.01	0.22	0.00	0.02	0.02	0.13	0.14	0.01	0.01	2.86
Total	0.02	4.71	0.03	4.76	0.02	2.70	0.03	2.76	0.01	0.84	0.07	0.92	0.00	0.05	0.05	2.13	2.18	0.23	0.03	10.87
Lead	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	0.00	0.00	0.00
SOx	0.00	0.51	0.00	0.51	0.00	0.27	0.00	0.28	0.00	0.11	0.00	0.11	0.00	0.01	0.01	0.19	0.20	0.02	0.00	1.12
Fuel Consumption (000 gallons)																				
Gasoline	28.41	5448.37	0.00	5476.78	30.41	2904.53	0.00	2934.94	9.28	1125.64	0.00	1134.92	5.23	98.98	104.21	0.00	104.21	37.55	13.09	9701.49
Diesel	0.00	0.00	5.54	5.54	0.00	0.00	12.31	12.31	0.00	0.00	46.55	46.55	0.00	0.00	0.00	1823.56	1823.56	141.60	0.00	2029.56

Title : Los Angeles County Subarea 2013 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2013 -- Model Years: 1968 to 2013  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	18572.	3695760.	6036.	3720370.	12786.	1584510.	10444.	1607740.	3347.	437331.	23444.	464122.	2276.	65264.	67541.	100888.	168428.	8752.	72757.	6042170.
VMT/1000	281.	126179.	131.	126591.	331.	53797.	332.	54460.	79.	15164.	974.	16217.	22.	1293.	1315.	9287.	10602.	952.	527.	209350.
Trips	72841.	23029800.	30187.	23132900.	50718.	9814270.	62549.	9927540.	26941.	4144330.	243481.	4414750.	45679.	774795.	820474.	1538890.	2359360.	35007.	145500.	40015000.
Reactive Organic Gas Emissions																				
Run Exh	1.91	7.50	0.04	9.45	2.31	5.57	0.04	7.92	0.64	2.16	0.18	2.98	0.13	0.75	0.88	2.82	3.70	1.65	1.62	27.33
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.04	0.04	0.42	0.46	0.00	0.00	0.53
Start Ex	0.41	9.97	0.00	10.39	0.28	5.45	0.00	5.73	0.18	3.03	0.00	3.21	0.51	1.41	1.91	0.00	1.91	0.08	0.36	21.69
Total Ex	2.33	17.47	0.04	19.84	2.59	11.02	0.04	13.66	0.83	5.26	0.19	6.27	0.64	2.19	2.83	3.24	6.07	1.73	1.98	49.55
Diurnal	0.14	3.21	0.00	3.36	0.10	1.64	0.00	1.74	0.01	0.46	0.00	0.47	0.00	0.01	0.02	0.00	0.02	0.00	0.16	5.73
Hot Soak	0.31	4.42	0.00	4.74	0.23	2.25	0.00	2.48	0.05	0.76	0.00	0.81	0.03	0.09	0.12	0.00	0.12	0.01	0.07	8.22
Running	1.43	14.15	0.00	15.57	0.49	13.60	0.00	14.08	0.16	6.18	0.00	6.34	0.21	2.42	2.63	0.00	2.63	0.07	0.32	39.01
Resting	0.07	1.64	0.00	1.71	0.05	0.85	0.00	0.90	0.01	0.23	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.90
Total	4.28	40.90	0.04	45.21	3.45	29.37	0.04	32.86	1.05	12.88	0.19	14.12	0.88	4.72	5.60	3.24	8.84	1.81	2.57	105.41
Carbon Monoxide Emissions																				
Run Exh	21.44	270.34	0.12	291.89	25.82	202.04	0.22	228.08	9.80	58.38	0.75	68.93	3.74	15.93	19.67	14.35	34.01	12.51	16.33	651.76
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.02	0.46	0.01	0.22	0.23	2.49	2.72	0.00	0.00	3.18
Start Ex	2.36	120.05	0.00	122.41	1.68	71.56	0.00	73.24	1.31	33.45	0.00	34.76	4.28	23.24	27.52	0.00	27.52	1.03	1.59	260.55
Total Ex	23.80	390.39	0.12	414.30	27.50	273.60	0.22	301.32	11.11	92.27	0.77	104.15	8.04	39.39	47.42	16.84	64.26	13.54	17.93	915.50
Oxides of Nitrogen Emissions																				
Run Exh	1.48	28.45	0.20	30.14	1.70	25.87	0.51	28.09	0.59	11.13	3.76	15.49	0.12	4.21	4.33	70.33	74.66	13.28	0.76	162.41
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	7.64	7.64	0.00	0.00	7.69
Start Ex	0.11	7.32	0.00	7.43	0.08	5.27	0.00	5.35	0.04	5.12	0.00	5.16	0.07	2.89	2.96	0.00	2.96	0.11	0.05	21.06
Total Ex	1.59	35.77	0.20	37.57	1.78	31.15	0.51	33.44	0.63	16.26	3.81	20.70	0.19	7.11	7.29	77.97	85.26	13.39	0.81	191.16
Carbon Dioxide Emissions (000)																				
Run Exh	0.16	51.13	0.05	51.34	0.19	27.23	0.13	27.54	0.05	10.50	0.51	11.06	0.01	0.85	0.87	20.45	21.32	1.91	0.09	113.27
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.39	0.40	0.00	0.00	0.41
Start Ex	0.02	1.84	0.00	1.85	0.01	0.97	0.00	0.99	0.01	0.40	0.00	0.41	0.01	0.03	0.04	0.00	0.04	0.00	0.01	3.30
Total Ex	0.17	52.97	0.05	53.20	0.20	28.20	0.13	28.53	0.06	10.92	0.51	11.49	0.03	0.89	0.92	20.84	21.76	1.91	0.09	116.98
PM10 Emissions																				
Run Exh	0.01	1.74	0.02	1.77	0.01	1.41	0.02	1.44	0.00	0.46	0.04	0.50	0.00	0.01	0.01	1.48	1.49	0.20	0.02	5.42
Idle Exh	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	0.12	0.12	0.00	0.00	0.13
Start Ex	0.00	0.17	0.00	0.17	0.00	0.13	0.00	0.13	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Total Ex	0.01	1.91	0.02	1.94	0.01	1.54	0.02	1.57	0.00	0.51	0.04	0.55	0.00	0.01	0.01	1.61	1.62	0.20	0.02	5.90
TireWear	0.00	1.11	0.00	1.12	0.00	0.47	0.00	0.48	0.00	0.14	0.01	0.16	0.00	0.02	0.02	0.30	0.32	0.01	0.00	2.09
BrakeWr	0.00	1.74	0.00	1.75	0.00	0.74	0.00	0.75	0.00	0.21	0.01	0.22	0.00	0.02	0.02	0.13	0.15	0.01	0.01	2.89
Total	0.02	4.76	0.02	4.81	0.02	2.76	0.03	2.81	0.01	0.86	0.07	0.93	0.00	0.05	0.05	2.04	2.09	0.22	0.03	10.88
Lead	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	0.00	0.00	0.00
SOx	0.00	0.51	0.00	0.52	0.00	0.28	0.00	0.28	0.00	0.11	0.00	0.11	0.00	0.01	0.01	0.20	0.21	0.02	0.00	1.14
Fuel Consumption (000 gallons)																				
Gasoline	22.35	5492.03	0.00	5514.37	25.54	2935.12	0.00	2960.66	8.08	1134.44	0.00	1142.52	4.09	98.44	102.53	0.00	102.53	38.55	13.27	9771.91
Diesel	0.00	0.00	4.72	4.72	0.00	0.00	11.44	11.44	0.00	0.00	46.17	46.17	0.00	0.00	0.00	1875.71	1875.71	140.09	0.00	2078.13

Title : Los Angeles County Subarea 2014 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2014 -- Model Years: 1969 to 2014  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline	Diesel	Total HD Trucks					
Vehicles	14379.	3743890.	5231.	3763500.	10443.	1605620.	9840.	1625910.	2838.	443069.	23491.	469398.	1800.	65908.	67709.	102607.	170316.	8853.	73573.	6111540.
VMT/1000	214.	127648.	112.	127974.	270.	54434.	310.	55013.	67.	15306.	966.	16339.	17.	1295.	1312.	9493.	10805.	963.	533.	211627.
Trips	55944.	23303700.	25784.	23385400.	41025.	9924910.	58487.	10024400.	21543.	4189170.	245614.	4456330.	37570.	771143.	808713.	1563750.	2372460.	35410.	147130.	40421200.
Reactive Organic Gas Emissions																				
Run Exh	1.47	6.86	0.03	8.35	1.89	5.23	0.04	7.17	0.56	2.05	0.17	2.79	0.10	0.66	0.76	2.66	3.42	1.64	1.61	24.97
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.42	0.46	0.00	0.00	0.54
Start Ex	0.32	9.07	0.00	9.38	0.23	5.09	0.00	5.32	0.15	2.89	0.00	3.03	0.41	1.33	1.74	0.00	1.74	0.08	0.36	19.92
Total Ex	1.78	15.92	0.03	17.74	2.12	10.33	0.04	12.49	0.71	5.01	0.18	5.90	0.51	2.03	2.54	3.08	5.63	1.72	1.97	45.43
Diurnal	0.11	3.05	0.00	3.17	0.08	1.60	0.00	1.68	0.01	0.45	0.00	0.46	0.00	0.01	0.01	0.00	0.01	0.00	0.16	5.48
Hot Soak	0.24	4.28	0.00	4.52	0.18	2.24	0.00	2.42	0.04	0.75	0.00	0.79	0.03	0.08	0.11	0.00	0.11	0.01	0.07	7.92
Running	1.06	13.44	0.00	14.50	0.35	13.34	0.00	13.69	0.11	6.18	0.00	6.29	0.16	2.42	2.58	0.00	2.58	0.07	0.30	37.41
Resting	0.05	1.64	0.00	1.69	0.04	0.87	0.00	0.91	0.01	0.24	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.90
Total	3.24	38.33	0.03	41.61	2.77	28.38	0.04	31.19	0.88	12.63	0.18	13.69	0.71	4.54	5.25	3.08	8.33	1.79	2.53	99.14
Carbon Monoxide Emissions																				
Run Exh	16.26	251.40	0.10	267.75	21.01	191.53	0.20	212.75	8.54	56.15	0.73	65.42	2.90	14.21	17.11	13.79	30.90	11.96	15.73	604.51
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.02	0.46	0.01	0.22	0.23	2.53	2.76	0.00	0.00	3.22
Start Ex	1.80	111.18	0.00	112.98	1.36	67.41	0.00	68.77	1.06	31.89	0.00	32.95	3.42	22.04	25.46	0.00	25.46	1.02	1.62	242.81
Total Ex	18.05	362.58	0.10	380.73	22.37	258.94	0.20	281.51	9.60	88.48	0.75	98.84	6.33	36.47	42.80	16.32	59.13	12.98	17.35	850.54
Oxides of Nitrogen Emissions																				
Run Exh	1.13	26.08	0.17	27.38	1.38	24.26	0.48	26.12	0.52	10.45	3.47	14.44	0.09	3.74	3.84	62.98	66.82	13.14	0.76	148.66
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	7.76	7.76	0.00	0.00	7.81
Start Ex	0.09	6.70	0.00	6.79	0.06	4.95	0.00	5.01	0.03	5.04	0.00	5.07	0.05	2.73	2.78	0.00	2.78	0.11	0.05	19.81
Total Ex	1.21	32.78	0.17	34.17	1.44	29.21	0.48	31.14	0.55	15.49	3.52	19.56	0.14	6.48	6.62	70.74	77.36	13.25	0.81	176.28
Carbon Dioxide Emissions (000)																				
Run Exh	0.12	51.61	0.04	51.77	0.15	27.55	0.12	27.82	0.04	10.59	0.51	11.15	0.01	0.85	0.87	20.93	21.80	1.92	0.09	114.55
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.39	0.40	0.00	0.00	0.42
Start Ex	0.01	1.85	0.00	1.86	0.01	0.98	0.00	0.99	0.01	0.41	0.00	0.41	0.01	0.03	0.04	0.00	0.04	0.00	0.01	3.32
Total Ex	0.13	53.46	0.04	53.64	0.16	28.53	0.12	28.81	0.05	11.02	0.51	11.58	0.02	0.89	0.91	21.32	22.24	1.93	0.10	118.29
PM10 Emissions																				
Run Exh	0.01	1.76	0.02	1.79	0.01	1.44	0.02	1.47	0.00	0.47	0.04	0.51	0.00	0.01	0.01	1.39	1.40	0.19	0.01	5.38
Idle Exh	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	0.12	0.12	0.00	0.00	0.12
Start Ex	0.00	0.17	0.00	0.17	0.00	0.13	0.00	0.13	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Total Ex	0.01	1.93	0.02	1.96	0.01	1.58	0.02	1.61	0.00	0.52	0.04	0.56	0.00	0.01	0.01	1.51	1.53	0.19	0.02	5.86
TireWear	0.00	1.13	0.00	1.13	0.00	0.48	0.00	0.49	0.00	0.14	0.01	0.16	0.00	0.02	0.02	0.31	0.33	0.01	0.00	2.11
BrakeWr	0.00	1.77	0.00	1.77	0.00	0.75	0.00	0.76	0.00	0.21	0.01	0.23	0.00	0.02	0.02	0.13	0.15	0.01	0.01	2.93
Total	0.01	4.82	0.02	4.86	0.02	2.81	0.03	2.85	0.00	0.87	0.06	0.94	0.00	0.05	0.05	1.96	2.00	0.22	0.03	10.90
Lead	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	0.00	0.00	0.00
SOx	0.00	0.52	0.00	0.52	0.00	0.28	0.00	0.28	0.00	0.11	0.00	0.11	0.00	0.01	0.01	0.20	0.21	0.02	0.00	1.15
Fuel Consumption (000 gallons)																				
Gasoline	17.05	5537.07	0.00	5554.12	20.78	2966.46	0.00	2987.24	6.91	1143.86	0.00	1150.78	3.26	98.03	101.29	0.00	101.29	38.79	13.43	9845.64
Diesel	0.00	0.00	4.02	4.02	0.00	0.00	10.68	10.68	0.00	0.00	45.91	45.91	0.00	0.00	0.00	1919.22	1919.22	141.23	0.00	2121.05

Title : Los Angeles County Subarea 2015 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2015 -- Model Years: 1970 to 2015  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	10881.	3791730.	4497.	3807110.	8290.	1626930.	9217.	1644440.	2380.	448839.	23507.	474726.	1431.	66500.	67931.	104294.	172225.	8954.	74397.	6181850.
VMT/1000	160.	129101.	95.	129355.	213.	55090.	288.	55591.	57.	15457.	958.	16471.	14.	1297.	1311.	9664.	10974.	974.	538.	213905.
Trips	41992.	23575200.	21897.	23639100.	32269.	10037200.	54373.	10123800.	16978.	4233800.	247636.	4498420.	29883.	768655.	798538.	1588310.	2386850.	35817.	148779.	40832800.
Reactive Organic Gas Emissions																				
Run Exh	1.10	6.30	0.03	7.43	1.51	4.92	0.03	6.47	0.49	1.96	0.17	2.61	0.08	0.58	0.66	2.51	3.18	1.63	1.60	22.91
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.43	0.47	0.00	0.00	0.54
Start Ex	0.23	8.25	0.00	8.48	0.18	4.75	0.00	4.93	0.12	2.74	0.00	2.86	0.32	1.26	1.58	0.00	1.58	0.08	0.36	18.29
Total Ex	1.33	14.55	0.03	15.91	1.69	9.67	0.03	11.39	0.61	4.77	0.17	5.55	0.40	1.88	2.28	2.94	5.22	1.71	1.96	41.74
Diurnal	0.09	2.91	0.00	2.99	0.06	1.57	0.00	1.63	0.01	0.44	0.00	0.45	0.00	0.01	0.01	0.00	0.01	0.00	0.16	5.24
Hot Soak	0.18	4.15	0.00	4.33	0.14	2.22	0.00	2.36	0.03	0.75	0.00	0.78	0.02	0.08	0.10	0.00	0.10	0.01	0.06	7.64
Running	0.78	12.80	0.00	13.58	0.27	13.07	0.00	13.34	0.09	6.18	0.00	6.27	0.13	2.41	2.54	0.00	2.54	0.07	0.28	36.08
Resting	0.04	1.63	0.00	1.67	0.03	0.89	0.00	0.92	0.00	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.89
Total	2.41	36.04	0.03	38.48	2.20	27.42	0.03	29.65	0.74	12.39	0.17	13.29	0.56	4.38	4.93	2.94	7.88	1.79	2.50	93.59
Carbon Monoxide Emissions																				
Run Exh	11.98	234.20	0.08	246.26	16.57	181.58	0.19	198.34	7.39	53.90	0.72	62.01	2.27	12.65	14.92	13.33	28.25	11.57	15.22	561.65
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.02	0.46	0.01	0.22	0.23	2.57	2.80	0.00	0.00	3.26
Start Ex	1.33	102.99	0.00	104.32	1.06	63.41	0.00	64.48	0.85	30.37	0.00	31.22	2.64	20.89	23.53	0.00	23.53	1.02	1.65	226.22
Total Ex	13.31	337.18	0.08	350.58	17.63	245.00	0.19	262.82	8.24	84.71	0.74	93.68	4.92	33.76	38.69	15.90	54.58	12.60	16.88	791.13
Oxides of Nitrogen Emissions																				
Run Exh	0.84	23.97	0.15	24.96	1.09	22.78	0.45	24.31	0.45	9.82	3.20	13.47	0.07	3.33	3.40	56.38	59.78	12.96	0.76	136.23
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	7.88	7.88	0.00	0.00	7.93
Start Ex	0.07	6.11	0.00	6.18	0.05	4.64	0.00	4.69	0.03	4.94	0.00	4.97	0.04	2.58	2.62	0.00	2.62	0.12	0.05	18.62
Total Ex	0.90	30.09	0.15	31.14	1.14	27.41	0.45	28.99	0.48	14.77	3.25	18.50	0.11	5.91	6.02	64.25	70.28	13.08	0.81	162.79
Carbon Dioxide Emissions (000)																				
Run Exh	0.09	52.07	0.04	52.19	0.12	27.87	0.11	28.10	0.04	10.69	0.51	11.24	0.01	0.86	0.87	21.32	22.19	1.94	0.09	115.75
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.40	0.41	0.00	0.00	0.43
Start Ex	0.01	1.87	0.00	1.88	0.01	0.99	0.00	1.00	0.00	0.41	0.00	0.42	0.01	0.03	0.04	0.00	0.04	0.00	0.01	3.34
Total Ex	0.10	53.93	0.04	54.07	0.13	28.87	0.11	29.11	0.04	11.12	0.51	11.67	0.02	0.89	0.91	21.72	22.63	1.94	0.10	119.52
PM10 Emissions																				
Run Exh	0.01	1.79	0.01	1.81	0.01	1.47	0.02	1.50	0.00	0.48	0.04	0.52	0.00	0.01	0.01	1.31	1.32	0.19	0.01	5.35
Idle Exh	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	0.12	0.12	0.00	0.00	0.12
Start Ex	0.00	0.17	0.00	0.17	0.00	0.14	0.00	0.14	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Total Ex	0.01	1.96	0.01	1.98	0.01	1.61	0.02	1.64	0.00	0.53	0.04	0.57	0.00	0.01	0.01	1.43	1.44	0.19	0.02	5.83
TireWear	0.00	1.14	0.00	1.14	0.00	0.49	0.00	0.49	0.00	0.15	0.01	0.16	0.00	0.02	0.02	0.32	0.33	0.01	0.00	2.14
BrakeWr	0.00	1.79	0.00	1.79	0.00	0.76	0.00	0.77	0.00	0.21	0.01	0.23	0.00	0.02	0.02	0.13	0.15	0.01	0.01	2.96
Total	0.01	4.88	0.02	4.91	0.01	2.86	0.02	2.89	0.00	0.89	0.06	0.95	0.00	0.05	0.05	1.88	1.93	0.22	0.03	10.93
Lead	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	0.00	0.00	0.00
SOx	0.00	0.52	0.00	0.52	0.00	0.28	0.00	0.28	0.00	0.11	0.00	0.11	0.00	0.01	0.01	0.21	0.22	0.02	0.00	1.16
Fuel Consumption (000 gallons)																				
Gasoline	12.71	5581.12	0.00	5593.82	16.43	2998.45	0.00	3014.88	5.86	1153.87	0.00	1159.73	2.58	97.68	100.26	0.00	100.26	39.17	13.60	9921.45
Diesel	0.00	0.00	3.39	3.39	0.00	0.00	9.91	9.91	0.00	0.00	45.69	45.69	0.00	0.00	0.00	1955.09	1955.09	142.00	0.00	2156.09

Title : Los Angeles County Subarea 2016 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2016 -- Model Years: 1971 to 2016  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	7978.	3839390.	3862.	3851230.	6444.	1648040.	8531.	1663020.	1920.	454723.	23467.	480111.	1067.	67134.	68201.	105948.	174149.	9056.	75223.	6252790.
VMT/1000	116.	130547.	80.	130743.	165.	55748.	264.	56177.	46.	15618.	949.	16613.	10.	1300.	1310.	9800.	11110.	985.	544.	216172.
Trips	30537.	23845600.	18625.	23894800.	24853.	10148700.	49935.	10223500.	13514.	4278720.	249334.	4541560.	23556.	766385.	789941.	1612320.	2402260.	36226.	150430.	41248800.
Reactive Organic Gas Emissions																				
Run Exh	0.79	5.82	0.02	6.63	1.17	4.63	0.03	5.84	0.41	1.86	0.16	2.43	0.06	0.51	0.57	2.39	2.96	1.60	1.59	21.05
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.44	0.47	0.00	0.00	0.55
Start Ex	0.17	7.51	0.00	7.68	0.14	4.43	0.00	4.56	0.09	2.60	0.00	2.70	0.25	1.19	1.44	0.00	1.44	0.08	0.36	16.82
Total Ex	0.96	13.34	0.02	14.31	1.31	9.06	0.03	10.40	0.50	4.54	0.16	5.20	0.31	1.73	2.05	2.83	4.87	1.68	1.95	38.41
Diurnal	0.06	2.78	0.00	2.84	0.05	1.53	0.00	1.58	0.01	0.44	0.00	0.44	0.00	0.01	0.01	0.00	0.01	0.00	0.16	5.03
Hot Soak	0.13	4.03	0.00	4.15	0.11	2.20	0.00	2.31	0.02	0.74	0.00	0.76	0.02	0.07	0.09	0.00	0.09	0.01	0.06	7.38
Running	0.55	12.23	0.00	12.78	0.20	12.80	0.00	13.00	0.07	6.17	0.00	6.23	0.11	2.39	2.50	0.00	2.50	0.07	0.27	34.86
Resting	0.03	1.61	0.00	1.64	0.03	0.91	0.00	0.93	0.00	0.25	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.88
Total	1.73	33.98	0.02	35.73	1.70	26.50	0.03	28.22	0.60	12.14	0.16	12.90	0.44	4.22	4.65	2.83	7.48	1.76	2.49	88.57
Carbon Monoxide Emissions																				
Run Exh	8.53	218.33	0.07	226.93	12.79	172.31	0.17	185.28	6.20	51.56	0.70	58.47	1.69	11.24	12.93	12.95	25.88	10.69	14.82	522.07
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.02	0.46	0.01	0.22	0.23	2.61	2.83	0.00	0.00	3.30
Start Ex	0.95	95.36	0.00	96.31	0.81	59.65	0.00	60.46	0.69	28.88	0.00	29.57	2.03	19.79	21.82	0.00	21.82	1.02	1.68	210.86
Total Ex	9.48	313.69	0.07	323.24	13.61	231.96	0.17	245.74	6.89	80.88	0.72	88.50	3.72	31.26	34.98	15.56	50.54	11.71	16.50	736.23
Oxides of Nitrogen Emissions																				
Run Exh	0.60	22.11	0.12	22.83	0.84	21.43	0.41	22.68	0.38	9.23	2.96	12.57	0.05	2.95	3.00	50.55	53.56	12.60	0.76	124.99
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.00	0.00	7.99	8.00	0.00	0.00	8.05
Start Ex	0.05	5.57	0.00	5.62	0.04	4.33	0.00	4.37	0.02	4.84	0.00	4.86	0.03	2.43	2.46	0.00	2.46	0.12	0.05	17.48
Total Ex	0.65	27.68	0.12	28.45	0.88	25.76	0.41	27.05	0.40	14.08	3.01	17.48	0.08	5.39	5.47	58.55	64.02	12.71	0.81	150.52
Carbon Dioxide Emissions (000)																				
Run Exh	0.06	52.53	0.03	52.63	0.09	28.20	0.10	28.39	0.03	10.80	0.50	11.34	0.01	0.86	0.87	21.63	22.50	1.94	0.09	116.89
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.41	0.41	0.00	0.00	0.43
Start Ex	0.01	1.88	0.00	1.89	0.01	1.01	0.00	1.01	0.00	0.42	0.00	0.42	0.01	0.03	0.04	0.00	0.04	0.00	0.01	3.37
Total Ex	0.07	54.42	0.03	54.52	0.10	29.21	0.10	29.41	0.03	11.23	0.51	11.77	0.01	0.90	0.91	22.04	22.95	1.94	0.10	120.69
PM10 Emissions																				
Run Exh	0.00	1.81	0.01	1.83	0.01	1.50	0.02	1.52	0.00	0.49	0.03	0.53	0.00	0.01	0.01	1.24	1.25	0.19	0.01	5.33
Idle Exh	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	0.12	0.12	0.00	0.00	0.12
Start Ex	0.00	0.17	0.00	0.17	0.00	0.14	0.00	0.14	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Total Ex	0.00	1.98	0.01	2.00	0.01	1.64	0.02	1.66	0.00	0.54	0.04	0.58	0.00	0.01	0.01	1.36	1.37	0.19	0.02	5.81
TireWear	0.00	1.15	0.00	1.15	0.00	0.49	0.00	0.50	0.00	0.15	0.01	0.16	0.00	0.02	0.02	0.32	0.34	0.01	0.00	2.16
BrakeWr	0.00	1.81	0.00	1.81	0.00	0.77	0.00	0.78	0.00	0.22	0.01	0.23	0.00	0.02	0.02	0.14	0.15	0.01	0.01	2.99
Total	0.01	4.94	0.01	4.96	0.01	2.90	0.02	2.93	0.00	0.90	0.06	0.96	0.00	0.05	0.05	1.82	1.87	0.21	0.03	10.96
Lead	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	0.00	0.00	0.00
SOx	0.00	0.53	0.00	0.53	0.00	0.28	0.00	0.29	0.00	0.11	0.00	0.11	0.00	0.01	0.01	0.21	0.22	0.02	0.00	1.17
Fuel Consumption (000 gallons)																				
Gasoline	9.17	5626.46	0.00	5635.63	12.72	3030.58	0.00	3043.30	4.81	1164.66	0.00	1169.48	1.97	97.43	99.40	0.00	99.40	39.73	13.75	10001.29
Diesel	0.00	0.00	2.86	2.86	0.00	0.00	9.09	9.09	0.00	0.00	45.50	45.50	0.00	0.00	0.00	1983.37	1983.37	141.63	0.00	2182.45

Title : Los Angeles County Subarea 2017 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2017 -- Model Years: 1972 to 2017  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	5183.	3886630.	3304.	3895110.	4487.	1669280.	7879.	1681650.	1503.	460629.	23373.	485504.	737.	67746.	68483.	107595.	176077.	9159.	76058.	6323560.
VMT/1000	74.	131991.	67.	132133.	115.	56422.	242.	56778.	36.	15788.	941.	16765.	7.	1304.	1311.	9922.	11233.	996.	550.	218455.
Trips	19722.	24114900.	15802.	24150400.	17198.	10262300.	45791.	10325300.	10304.	4324160.	250779.	4585250.	16847.	764863.	781710.	1636300.	2418010.	36635.	152100.	41667700.
Reactive Organic Gas Emissions																				
Run Exh	0.49	5.40	0.02	5.90	0.80	4.37	0.03	5.20	0.33	1.76	0.15	2.25	0.04	0.45	0.49	2.28	2.77	1.59	1.58	19.29
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.44	0.48	0.00	0.00	0.56
Start Ex	0.10	6.85	0.00	6.95	0.09	4.13	0.00	4.22	0.07	2.46	0.00	2.54	0.18	1.12	1.30	0.00	1.30	0.08	0.36	15.44
Total Ex	0.59	12.25	0.02	12.86	0.89	8.50	0.03	9.42	0.41	4.30	0.15	4.86	0.22	1.60	1.82	2.72	4.54	1.66	1.95	35.29
Diurnal	0.04	2.66	0.00	2.70	0.03	1.49	0.00	1.53	0.00	0.43	0.00	0.43	0.00	0.01	0.01	0.00	0.01	0.00	0.16	4.83
Hot Soak	0.08	3.90	0.00	3.98	0.07	2.17	0.00	2.25	0.02	0.73	0.00	0.74	0.01	0.07	0.08	0.00	0.08	0.01	0.06	7.13
Running	0.33	11.70	0.00	12.03	0.13	12.52	0.00	12.65	0.05	6.15	0.00	6.19	0.08	2.37	2.45	0.00	2.45	0.07	0.26	33.66
Resting	0.02	1.59	0.00	1.61	0.02	0.92	0.00	0.94	0.00	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.86
Total	1.07	32.10	0.02	33.18	1.15	25.60	0.03	26.78	0.47	11.87	0.15	12.49	0.31	4.06	4.37	2.72	7.09	1.74	2.48	83.77
Carbon Monoxide Emissions																				
Run Exh	5.31	203.59	0.06	208.96	8.81	163.70	0.16	172.66	5.14	49.20	0.69	55.04	1.17	9.96	11.13	12.63	23.76	10.11	14.50	485.02
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.02	0.46	0.01	0.22	0.23	2.64	2.87	0.00	0.00	3.33
Start Ex	0.59	88.22	0.00	88.81	0.56	56.12	0.00	56.68	0.55	27.43	0.00	27.98	1.42	18.73	20.14	0.00	20.14	1.01	1.71	196.33
Total Ex	5.90	291.81	0.06	297.77	9.37	219.82	0.16	229.34	5.69	77.08	0.71	83.48	2.59	28.91	31.50	15.28	46.78	11.12	16.21	684.69
Oxides of Nitrogen Emissions																				
Run Exh	0.38	20.45	0.10	20.93	0.57	20.22	0.38	21.17	0.31	8.68	2.73	11.73	0.04	2.62	2.65	45.37	48.03	12.48	0.76	115.09
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.00	0.00	8.11	8.11	0.00	0.00	8.17
Start Ex	0.03	5.07	0.00	5.10	0.03	4.04	0.00	4.06	0.02	4.73	0.00	4.75	0.02	2.30	2.32	0.00	2.32	0.12	0.05	16.40
Total Ex	0.41	25.51	0.10	26.03	0.60	24.26	0.38	25.23	0.33	13.42	2.78	16.53	0.06	4.92	4.98	53.48	58.46	12.60	0.82	139.66
Carbon Dioxide Emissions (000)																				
Run Exh	0.04	53.01	0.03	53.08	0.06	28.53	0.09	28.69	0.03	10.91	0.50	11.44	0.00	0.86	0.87	21.91	22.77	1.96	0.10	118.04
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.41	0.42	0.00	0.00	0.44
Start Ex	0.00	1.90	0.00	1.90	0.00	1.02	0.00	1.02	0.00	0.42	0.00	0.42	0.00	0.03	0.03	0.00	0.03	0.00	0.01	3.39
Total Ex	0.05	54.91	0.03	54.98	0.07	29.55	0.09	29.71	0.03	11.35	0.50	11.88	0.01	0.90	0.91	22.32	23.23	1.96	0.10	121.87
PM10 Emissions																				
Run Exh	0.00	1.83	0.01	1.84	0.00	1.53	0.01	1.55	0.00	0.50	0.03	0.53	0.00	0.01	0.01	1.18	1.19	0.19	0.01	5.31
Idle Exh	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	0.12	0.12	0.00	0.00	0.12
Start Ex	0.00	0.17	0.00	0.17	0.00	0.14	0.00	0.14	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Total Ex	0.00	2.00	0.01	2.02	0.00	1.67	0.01	1.69	0.00	0.55	0.03	0.58	0.00	0.01	0.01	1.30	1.31	0.19	0.02	5.80
TireWear	0.00	1.16	0.00	1.17	0.00	0.50	0.00	0.50	0.00	0.15	0.01	0.16	0.00	0.02	0.02	0.33	0.34	0.01	0.00	2.18
BrakeWr	0.00	1.83	0.00	1.83	0.00	0.78	0.00	0.79	0.00	0.22	0.01	0.23	0.00	0.02	0.02	0.14	0.16	0.01	0.01	3.02
Total	0.00	4.99	0.01	5.01	0.01	2.95	0.02	2.97	0.00	0.91	0.06	0.97	0.00	0.05	0.05	1.76	1.81	0.21	0.03	11.00
Lead	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	0.00	0.00	0.00
SOx	0.00	0.53	0.00	0.53	0.00	0.29	0.00	0.29	0.00	0.11	0.00	0.12	0.00	0.01	0.01	0.21	0.22	0.02	0.00	1.18
Fuel Consumption (000 gallons)																				
Gasoline	5.86	5673.02	0.00	5678.88	8.82	3063.62	0.00	3072.44	3.88	1176.06	0.00	1179.94	1.39	97.29	98.68	0.00	98.68	39.94	13.90	10083.79
Diesel	0.00	0.00	2.41	2.41	0.00	0.00	8.32	8.32	0.00	0.00	45.32	45.32	0.00	0.00	0.00	2008.73	2008.73	142.93	0.00	2207.70

Title : Los Angeles County Subarea 2018 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2018 -- Model Years: 1973 to 2018  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	2594.	3934080.	2830.	3939500.	2621.	1690660.	7204.	1700480.	1086.	466611.	23256.	490954.	452.	68349.	68801.	109232.	178033.	9262.	76902.	6395140.
VMT/1000	37.	133456.	57.	133550.	67.	57109.	219.	57395.	26.	15967.	934.	16927.	4.	1310.	1314.	10028.	11342.	1008.	556.	220777.
Trips	9883.	24387800.	13440.	24411000.	10040.	10378300.	41532.	10429900.	6909.	4371090.	252062.	4630060.	10496.	764175.	774671.	1660440.	2435110.	37049.	153789.	42097000.
Reactive Organic Gas Emissions																				
Run Exh	0.22	5.02	0.01	5.25	0.43	4.14	0.03	4.59	0.26	1.67	0.14	2.07	0.03	0.39	0.41	2.19	2.60	1.57	1.59	17.67
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.45	0.49	0.00	0.00	0.56
Start Ex	0.04	6.26	0.00	6.30	0.05	3.85	0.00	3.90	0.05	2.33	0.00	2.38	0.11	1.05	1.16	0.00	1.16	0.08	0.36	14.18
Total Ex	0.26	11.27	0.01	11.55	0.47	7.99	0.03	8.49	0.31	4.07	0.15	4.53	0.14	1.48	1.61	2.64	4.25	1.65	1.95	32.41
Diurnal	0.02	2.55	0.00	2.57	0.02	1.46	0.00	1.48	0.00	0.42	0.00	0.42	0.00	0.01	0.01	0.00	0.01	0.00	0.16	4.65
Hot Soak	0.03	3.77	0.00	3.81	0.04	2.14	0.00	2.18	0.01	0.72	0.00	0.73	0.01	0.07	0.07	0.00	0.07	0.01	0.06	6.86
Running	0.13	11.22	0.00	11.35	0.06	12.23	0.00	12.30	0.02	6.11	0.00	6.13	0.05	2.35	2.39	0.00	2.39	0.07	0.26	32.50
Resting	0.01	1.57	0.00	1.58	0.01	0.93	0.00	0.94	0.00	0.26	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.83
Total	0.46	30.38	0.01	30.86	0.61	24.74	0.03	25.38	0.35	11.58	0.15	12.07	0.19	3.90	4.10	2.64	6.73	1.73	2.48	79.25
Carbon Monoxide Emissions																				
Run Exh	2.40	189.95	0.05	192.40	5.02	155.63	0.14	160.80	4.11	46.98	0.67	51.77	0.72	8.86	9.58	12.38	21.95	9.56	14.26	450.74
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.02	0.47	0.00	0.22	0.23	2.68	2.91	0.00	0.00	3.37
Start Ex	0.27	81.58	0.00	81.85	0.32	52.83	0.00	53.14	0.39	26.08	0.00	26.47	0.88	17.71	18.59	0.00	18.59	1.01	1.74	182.80
Total Ex	2.67	271.53	0.05	274.25	5.34	208.46	0.14	213.94	4.51	73.51	0.69	78.70	1.60	26.78	28.39	15.06	43.45	10.58	16.00	636.92
Oxides of Nitrogen Emissions																				
Run Exh	0.18	18.98	0.09	19.25	0.32	19.13	0.34	19.79	0.25	8.18	2.52	10.95	0.02	2.33	2.35	40.77	43.12	12.01	0.77	105.89
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.00	0.00	8.23	8.23	0.00	0.00	8.29
Start Ex	0.01	4.61	0.00	4.62	0.01	3.76	0.00	3.78	0.01	4.62	0.00	4.63	0.01	2.17	2.19	0.00	2.19	0.12	0.05	15.39
Total Ex	0.20	23.58	0.09	23.87	0.34	22.90	0.34	23.57	0.26	12.80	2.58	15.64	0.03	4.50	4.54	49.00	53.53	12.13	0.82	129.57
Carbon Dioxide Emissions (000)																				
Run Exh	0.02	53.48	0.02	53.53	0.04	28.87	0.08	28.99	0.02	11.03	0.50	11.55	0.00	0.86	0.87	22.14	23.01	1.95	0.10	119.13
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.42	0.43	0.00	0.00	0.44
Start Ex	0.00	1.92	0.00	1.92	0.00	1.03	0.00	1.03	0.00	0.43	0.00	0.43	0.00	0.03	0.03	0.00	0.03	0.00	0.01	3.42
Total Ex	0.02	55.40	0.02	55.45	0.04	29.90	0.08	30.02	0.02	11.48	0.50	12.00	0.01	0.90	0.91	22.56	23.47	1.96	0.11	122.99
PM10 Emissions																				
Run Exh	0.00	1.85	0.01	1.86	0.00	1.55	0.01	1.57	0.00	0.51	0.03	0.54	0.00	0.01	0.01	1.13	1.14	0.18	0.01	5.30
Idle Exh	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	0.12	0.12	0.00	0.00	0.12
Start Ex	0.00	0.17	0.00	0.17	0.00	0.14	0.00	0.14	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Total Ex	0.00	2.03	0.01	2.04	0.00	1.69	0.01	1.71	0.00	0.56	0.03	0.59	0.00	0.01	0.01	1.24	1.25	0.18	0.01	5.79
TireWear	0.00	1.18	0.00	1.18	0.00	0.50	0.00	0.51	0.00	0.15	0.01	0.16	0.00	0.02	0.02	0.33	0.35	0.01	0.00	2.21
BrakeWr	0.00	1.85	0.00	1.85	0.00	0.79	0.00	0.79	0.00	0.22	0.01	0.23	0.00	0.02	0.02	0.14	0.16	0.01	0.01	3.05
Total	0.00	5.05	0.01	5.06	0.00	2.99	0.02	3.01	0.00	0.93	0.06	0.98	0.00	0.05	0.05	1.71	1.76	0.21	0.02	11.04
Lead	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	0.00	0.00	0.00
SOx	0.00	0.54	0.00	0.54	0.00	0.29	0.00	0.29	0.00	0.11	0.00	0.12	0.00	0.01	0.01	0.22	0.22	0.02	0.00	1.19
Fuel Consumption (000 gallons)																				
Gasoline	2.88	5719.54	0.00	5722.42	5.13	3097.09	0.00	3102.22	2.96	1188.19	0.00	1191.14	0.86	97.31	98.17	0.00	98.17	40.81	14.06	10168.82
Diesel	0.00	0.00	2.03	2.03	0.00	0.00	7.54	7.54	0.00	0.00	45.21	45.21	0.00	0.00	0.00	2030.05	2030.05	141.70	0.00	2226.53

Title : Los Angeles County Subarea 2019 Winter Default Title  
 Version : Emfac2002 V2.2 Sept 23 2002  
 Run Date : 10/18/05 09:58:56  
 Scen Year: 2019 -- Model Years: 1974 to 2019  
 Season : Winter  
 Area : Los Angeles (SC)  
 I/M Stat : I and M program in effect  
 Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline	Diesel	Total HD Trucks					
Vehicles	994.	3980600.	2407.	3984000.	1406.	1711380.	6574.	1719360.	819.	472450.	23128.	496398.	287.	68891.	69178.	110820.	179999.	9366.	77748.	6466870.
VMT/1000	15.	134897.	48.	134959.	36.	57775.	198.	58009.	20.	16145.	928.	17094.	3.	1316.	1319.	10130.	11449.	1019.	561.	223091.
Trips	3845.	24657200.	11368.	24672400.	5403.	10491300.	37583.	10534300.	4724.	4417250.	253242.	4675210.	6199.	763653.	769852.	1683310.	2453160.	37464.	155480.	42528000.
Reactive Organic Gas Emissions																				
Run Exh	0.05	4.68	0.01	4.74	0.18	3.92	0.02	4.12	0.21	1.58	0.13	1.93	0.02	0.34	0.35	2.11	2.46	1.56	1.59	16.39
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.46	0.49	0.00	0.00	0.57
Start Ex	0.01	5.73	0.00	5.74	0.02	3.59	0.00	3.61	0.04	2.20	0.00	2.23	0.06	0.99	1.06	0.00	1.06	0.08	0.37	13.08
Total Ex	0.06	10.41	0.01	10.47	0.20	7.51	0.02	7.73	0.24	3.85	0.14	4.24	0.08	1.37	1.45	2.56	4.01	1.64	1.95	30.04
Diurnal	0.01	2.44	0.00	2.45	0.01	1.42	0.00	1.43	0.00	0.41	0.00	0.41	0.00	0.01	0.01	0.00	0.01	0.00	0.16	4.47
Hot Soak	0.01	3.65	0.00	3.66	0.02	2.10	0.00	2.13	0.00	0.70	0.00	0.71	0.00	0.06	0.07	0.00	0.07	0.01	0.06	6.63
Running	0.05	10.77	0.00	10.82	0.03	11.94	0.00	11.97	0.01	6.05	0.00	6.06	0.03	2.30	2.33	0.00	2.33	0.07	0.25	31.51
Resting	0.00	1.54	0.00	1.54	0.01	0.93	0.00	0.94	0.00	0.27	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.80
Total	0.12	28.81	0.01	28.94	0.27	23.90	0.02	24.20	0.26	11.29	0.14	11.69	0.11	3.74	3.86	2.56	6.42	1.72	2.48	75.44
Carbon Monoxide Emissions																				
Run Exh	0.71	177.49	0.04	178.24	2.67	147.93	0.13	150.73	3.39	44.89	0.66	48.94	0.44	7.88	8.32	12.16	20.48	9.16	14.10	421.65
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.02	0.47	0.00	0.22	0.23	2.72	2.94	0.00	0.00	3.41
Start Ex	0.08	75.46	0.00	75.53	0.17	49.72	0.00	49.88	0.29	24.82	0.00	25.11	0.52	16.72	17.24	0.00	17.24	1.01	1.77	170.54
Total Ex	0.79	252.95	0.04	253.78	2.83	197.65	0.13	200.61	3.68	70.16	0.68	74.51	0.97	24.82	25.79	14.88	40.67	10.17	15.86	595.60
Oxides of Nitrogen Emissions																				
Run Exh	0.07	17.68	0.07	17.82	0.16	18.14	0.31	18.61	0.20	7.72	2.32	10.25	0.01	2.08	2.09	36.70	38.79	11.69	0.77	97.93
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.00	0.00	8.34	8.34	0.00	0.00	8.40
Start Ex	0.00	4.19	0.00	4.20	0.01	3.50	0.00	3.51	0.01	4.51	0.00	4.52	0.01	2.05	2.06	0.00	2.06	0.12	0.05	14.46
Total Ex	0.07	21.87	0.07	22.02	0.17	21.64	0.31	22.12	0.21	12.23	2.38	14.83	0.02	4.13	4.15	45.04	49.19	11.81	0.83	120.80
Carbon Dioxide Emissions (000)																				
Run Exh	0.01	53.96	0.02	53.98	0.02	29.19	0.08	29.29	0.02	11.15	0.50	11.67	0.00	0.87	0.87	22.36	23.24	1.96	0.10	120.23
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.42	0.43	0.00	0.00	0.45
Start Ex	0.00	1.93	0.00	1.93	0.00	1.04	0.00	1.04	0.00	0.43	0.00	0.43	0.00	0.03	0.03	0.00	0.03	0.00	0.01	3.45
Total Ex	0.01	55.89	0.02	55.92	0.02	30.23	0.08	30.33	0.02	11.60	0.50	12.12	0.00	0.91	0.91	22.79	23.70	1.96	0.11	124.13
PM10 Emissions																				
Run Exh	0.00	1.88	0.01	1.88	0.00	1.58	0.01	1.59	0.00	0.51	0.03	0.54	0.00	0.01	0.01	1.08	1.09	0.18	0.01	5.29
Idle Exh	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	0.11	0.11	0.00	0.00	0.00	0.12
Start Ex	0.00	0.18	0.00	0.18	0.00	0.14	0.00	0.14	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Total Ex	0.00	2.05	0.01	2.06	0.00	1.72	0.01	1.73	0.00	0.56	0.03	0.59	0.00	0.01	0.01	1.19	1.20	0.18	0.01	5.78
TireWear	0.00	1.19	0.00	1.19	0.00	0.51	0.00	0.51	0.00	0.15	0.01	0.16	0.00	0.02	0.02	0.33	0.35	0.01	0.00	2.23
BrakeWr	0.00	1.87	0.00	1.87	0.00	0.80	0.00	0.80	0.00	0.22	0.01	0.24	0.00	0.02	0.02	0.14	0.16	0.01	0.01	3.08
Total	0.00	5.11	0.01	5.12	0.00	3.03	0.02	3.04	0.00	0.94	0.05	0.99	0.00	0.05	0.05	1.66	1.71	0.20	0.02	11.09
Lead	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	0.00	0.00	0.00
SOx	0.00	0.54	0.00	0.54	0.00	0.29	0.00	0.29	0.00	0.11	0.00	0.12	0.00	0.01	0.01	0.22	0.23	0.02	0.00	1.20
Fuel Consumption (000 gallons)																				
Gasoline	1.07	5766.22	0.00	5767.29	2.75	3129.57	0.00	3132.32	2.34	1200.29	0.00	1202.63	0.52	97.40	97.92	0.00	97.92	41.47	14.21	10255.84
Diesel	0.00	0.00	1.70	1.70	0.00	0.00	6.82	6.82	0.00	0.00	45.18	45.18	0.00	0.00	0.00	2050.90	2050.90	141.47	0.00	2246.07

Title : Los Angeles County Subarea 2011 Winter  
Version : Emfac2002 V2.2 Sept 23 2002  
Run Date : 04/20/05 12:44:01  
Scen Year: 2020 -- Model Years: 1975 to 2020  
Season : Winter  
Area : Los Angeles (SC)  
I/M Stat : I and M program in effect  
Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles		
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline	Diesel	Total					
Vehicles	798.	4025720.	2060.	4028580.	843.	1731600.	5995.	1738440.	604.	478276.	23026.	501905.	135.	69457.	69592.	112388.	181980.	9471.	78603.	6538980.
VMT/1000	12.	136318.	40.	136370.	22.	58430.	179.	58630.	15.	16327.	924.	17267.	1.	1324.	1325.	10228.	11552.	1030.	567.	225417.
Trips	3051.	24922300.	9670.	24935000.	3239.	10603000.	33968.	10640200.	3075.	4464080.	254514.	4721670.	2720.	762980.	765700.	1706020.	2471720.	37884.	157191.	42963700.
Reactive Organic Gas Emissions																				
Run Exh	0.04	4.35	0.01	4.40	0.06	3.66	0.02	3.74	0.17	1.50	0.13	1.79	0.01	0.30	0.30	2.04	2.34	1.55	1.59	15.42
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.08	0.00	0.04	0.04	0.46	0.50	0.00	0.00	0.58
Start Ex	0.01	5.24	0.00	5.25	0.01	3.34	0.00	3.34	0.02	2.07	0.00	2.10	0.03	0.93	0.96	0.00	0.96	0.08	0.37	12.09
Total Ex	0.05	9.59	0.01	9.64	0.07	7.00	0.02	7.08	0.19	3.65	0.13	3.97	0.04	1.26	1.30	2.50	3.80	1.62	1.96	28.08
Diurnal	0.01	2.34	0.00	2.34	0.01	1.39	0.00	1.39	0.00	0.40	0.00	0.40	0.00	0.01	0.01	0.00	0.01	0.00	0.16	4.31
Hot Soak	0.01	3.51	0.00	3.51	0.01	2.06	0.00	2.07	0.00	0.69	0.00	0.69	0.00	0.06	0.06	0.00	0.06	0.01	0.06	6.40
Running	0.04	10.32	0.00	10.35	0.02	11.63	0.00	11.65	0.01	5.98	0.00	5.98	0.01	2.25	2.27	0.00	2.27	0.07	0.25	30.57
Resting	0.00	1.50	0.00	1.50	0.00	0.93	0.00	0.94	0.00	0.27	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.05	2.76
Total	0.10	27.25	0.01	27.35	0.11	23.01	0.02	23.14	0.20	10.98	0.13	11.32	0.05	3.58	3.64	2.50	6.14	1.71	2.49	72.13
Carbon Monoxide Emissions																				
Run Exh	0.57	165.85	0.03	166.45	1.63	139.76	0.11	141.50	2.80	42.94	0.65	46.38	0.21	7.08	7.29	12.00	19.28	8.70	13.99	396.30
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.02	0.47	0.00	0.22	0.22	2.76	2.98	0.00	0.00	3.45
Start Ex	0.06	69.74	0.00	69.80	0.10	46.66	0.00	46.76	0.22	23.66	0.00	23.87	0.23	15.77	16.01	0.00	16.01	1.00	1.79	159.24
Total Ex	0.63	235.59	0.03	236.25	1.73	186.41	0.11	188.26	3.01	67.05	0.66	70.72	0.44	23.08	23.52	14.75	38.27	9.70	15.78	558.99
Oxides of Nitrogen Emissions																				
Run Exh	0.05	16.46	0.06	16.58	0.09	17.18	0.28	17.55	0.17	7.30	2.14	9.61	0.01	1.86	1.87	33.16	35.02	11.40	0.78	90.93
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.00	0.00	8.46	8.46	0.00	0.00	8.52
Start Ex	0.00	3.82	0.00	3.82	0.00	3.26	0.00	3.27	0.01	4.40	0.00	4.41	0.00	1.94	1.94	0.00	1.94	0.12	0.05	13.61
Total Ex	0.06	20.28	0.06	20.40	0.10	20.44	0.28	20.81	0.17	11.71	2.19	14.08	0.01	3.80	3.81	41.61	45.42	11.52	0.83	113.07
Carbon Dioxide Emissions (000)																				
Run Exh	0.01	54.43	0.02	54.45	0.01	29.52	0.07	29.60	0.01	11.27	0.50	11.79	0.00	0.87	0.87	22.58	23.45	1.96	0.10	121.35
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.43	0.44	0.00	0.00	0.46
Start Ex	0.00	1.95	0.00	1.95	0.00	1.05	0.00	1.05	0.00	0.44	0.00	0.44	0.00	0.03	0.03	0.00	0.03	0.00	0.01	3.48
Total Ex	0.01	56.37	0.02	56.40	0.01	30.56	0.07	30.64	0.01	11.73	0.50	12.24	0.00	0.91	0.91	23.01	23.92	1.97	0.11	125.28
PM10 Emissions																				
Run Exh	0.00	1.90	0.01	1.90	0.00	1.60	0.01	1.61	0.00	0.52	0.03	0.55	0.00	0.01	0.01	1.04	1.04	0.17	0.01	5.29
Idle Exh	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	0.11	0.11	0.00	0.00	0.12
Start Ex	0.00	0.18	0.00	0.18	0.00	0.14	0.00	0.14	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Total Ex	0.00	2.07	0.01	2.08	0.00	1.74	0.01	1.75	0.00	0.57	0.03	0.60	0.00	0.01	0.01	1.15	1.16	0.17	0.01	5.78
TireWear	0.00	1.20	0.00	1.20	0.00	0.52	0.00	0.52	0.00	0.15	0.01	0.17	0.00	0.02	0.02	0.34	0.35	0.01	0.00	2.25
BrakeWr	0.00	1.88	0.00	1.89	0.00	0.81	0.00	0.81	0.00	0.23	0.01	0.24	0.00	0.02	0.02	0.14	0.16	0.01	0.01	3.12
Total	0.00	5.16	0.01	5.17	0.00	3.06	0.01	3.08	0.00	0.95	0.05	1.00	0.00	0.05	0.05	1.63	1.67	0.20	0.02	11.15
Lead	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	0.00	0.00	0.00
SOx	0.00	0.54	0.00	0.55	0.00	0.30	0.00	0.30	0.00	0.11	0.00	0.12	0.00	0.01	0.01	0.22	0.23	0.02	0.00	1.21
Fuel Consumption (000 gallons)																				
Gasoline	0.85	5812.89	0.00	5813.74	1.65	3161.45	0.00	3163.10	1.84	1212.67	0.00	1214.50	0.24	97.59	97.83	0.00	97.83	42.08	14.36	10345.61
Diesel	0.00	0.00	1.43	1.43	0.00	0.00	6.17	6.17	0.00	0.00	45.22	45.22	0.00	0.00	0.00	2070.50	2070.50	141.43	0.00	2264.74

PROJECT NAME: Hyperion Full Expansion  
 PROJECT #: 2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0213647	0.0025777	0.0289760	0.0000384	0.0005467
Light Duty Cars (Worker Vehicle)	0.1349322	0.0150368	0.0129952	0.0001046	0.0009610
<b>Assumptions:</b>					
Construction Year	2008				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.469	0.086	1.029	0.243	0.055
Backhoe/Loader	0.420	0.122	0.799	0.115	0.083
Loader	0.420	0.122	0.799	0.115	0.083
Grader	0.540	0.112	1.331	0.276	0.069
Crane	0.350	0.080	0.941	0.196	0.049
Fork Lift	0.254	0.074	0.432	-	0.048
Concrete Pump	0.046	0.01	0.072	-	0.005
Crushing/Processing Equip	0.836	0.217	1.703	0.286	0.125
Compressor/Generator	0.315	0.090	0.635	0.001	0.047
Power Tools	0.534	0.115	1.336	0.223	0.063

Source: South Coast Air Quality Management District (SCAQMD)

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Worker Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>

Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook \*\*Note: Weighted average based on travel characteristics

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor $(2.1)(G/12)(H/30)((J/3)^{0.7})((I/4)^{0.5})((365-K)/365)$	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

PROJECT NAME: Hyperion Full Expansion  
 PROJECT #: 2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Demolition (parking lot)</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Backhoe/Loader	1	13	5.46	1.59	10.39	1.50	1.08
Loader	1	13	5.46	1.59	10.39	1.50	1.08
<b>Total</b>	<b>3</b>		<b>15.47</b>	<b>4.21</b>	<b>33.01</b>	<b>5.54</b>	<b>2.80</b>
<b>Demolition (admin bldg &amp; old lab bldg)</b>							
Crane	2	13	4.55	1.04	12.23	2.55	0.64
Backhoe/Loader	2	13	5.46	1.59	10.39	1.50	1.08
Loader	2	13	5.46	1.59	10.39	1.50	1.08
<b>Total</b>	<b>6</b>		<b>15.47</b>	<b>4.21</b>	<b>33.01</b>	<b>5.54</b>	<b>2.80</b>
<b>Clarifier Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>59.87</b>	<b>14.74</b>	<b>129.14</b>	<b>20.66</b>	<b>9.26</b>
<b>Clarifier Construction</b>							
Crane	2	13	9.10	2.08	24.47	5.10	1.27
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>20.66</b>	<b>4.78</b>	<b>48.23</b>	<b>9.75</b>	<b>3.07</b>
<b>Egg-Shaped Digesters Demolition</b>							
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Crane	1	13	9.10	1.04	12.23	2.55	0.64
Backhoe/Loader	1	13	10.92	1.59	10.39	1.50	1.08
Loader	1	13	10.92	1.59	10.39	1.50	1.08
<b>Total</b>	<b>5</b>		<b>43.13</b>	<b>6.45</b>	<b>59.76</b>	<b>11.86</b>	<b>4.23</b>
<b>Egg-Shaped Digesters Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	3	13	18.29	3.35	40.13	9.48	2.15
Loader	5	13	27.30	7.93	51.94	7.48	5.40
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>57.54</b>	<b>14.46</b>	<b>118.17</b>	<b>19.51</b>	<b>9.41</b>
<b>Egg-Shaped Digesters Foundation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Fork Lift	3	13	9.91	2.89	16.85	0.00	1.87
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>12</b>		<b>50.65</b>	<b>12.64</b>	<b>108.10</b>	<b>14.51</b>	<b>7.76</b>
<b>Egg-Shaped Digesters Construction</b>							
Crane	2	13	9.10	2.08	24.47	5.10	1.27
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	3	13	9.91	2.89	16.85	0.00	1.87
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>48.54</b>	<b>11.83</b>	<b>108.07</b>	<b>15.56</b>	<b>7.19</b>
<b>Sludge Dryinb Building Demolition</b>							
Crane	1	13	9.10	1.04	12.23	2.55	0.64
Backhoe/Loader	1	13	10.92	1.59	10.39	1.50	1.08
Loader	1	13	10.92	1.59	10.39	1.50	1.08
<b>Total</b>	<b>3</b>		<b>30.94</b>	<b>4.21</b>	<b>33.01</b>	<b>5.54</b>	<b>2.80</b>
<b>Biosolids Handling Building Grading</b>							
Grader	1	13	7.02	1.46	17.30	3.59	0.90
Loader	1	13	5.46	1.59	10.39	1.50	1.08
<b>Total</b>	<b>2</b>		<b>12.48</b>	<b>3.04</b>	<b>27.69</b>	<b>5.08</b>	<b>1.98</b>
<b>Biosolids Handling Building Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
<b>Total</b>	<b>6</b>		<b>19.97</b>	<b>5.43</b>	<b>40.50</b>	<b>5.54</b>	<b>3.55</b>

equipment emissions = # equipment \* hours of use \* emissions factor

**PROJECT NAME:** Hyperion Full Expansion  
**PROJECT #:** 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)							
	CO	ROG	NOX	NOx w/ mit	SOX	PM10	PM10 w/ mit	
Demolition - parking lot	15.47	4.21	33.01	28.39	5.54	2.80	1.03	
Demolition - admin bldg & old lab bldg	15.47	4.21	33.01	28.39	5.54	2.80	1.03	
Clarifier Excavation	59.87	14.74	129.14	111.06	20.66	9.26	3.42	
Clarifier Construction	20.66	4.78	48.23	41.48	9.75	3.07	1.14	
Egg-Shaped Digester Demolition	43.13	6.45	59.76	51.39	11.86	4.23	1.56	
Egg-Shaped Digester Excavation	57.54	14.46	118.17	101.63	19.51	9.41	3.48	
Egg-Shaped Digester Foundation	50.65	12.64	108.10	92.96	14.51	7.76	2.87	
Egg-Shaped Digester Construction	48.54	11.83	108.07	92.94	15.56	7.19	2.66	
Sludge Drying Building Demolition	30.94	4.21	33.01	28.39	5.54	2.80	1.03	
Biosolids Handling Grading	12.48	3.04	27.69	23.81	5.08	1.98	0.73	
Biosolids Handling Construction	19.97	5.43	40.50	34.83	5.54	3.55	1.31	

equipment emissions = # equipment \* hours of use \* emissions factor

**WORKER VEHICLES (off site)**

Construction Phase	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Demolition - parking lot	20.0	10	400	53.97	6.01	5.20	0.042	0.38
Demolition - admin bldg & old lab bldg	20.0	20	800	107.95	12.03	10.40	0.084	0.77
Clarifier Excavation	20.0	45	1,800	242.88	27.07	23.39	0.188	1.73
Clarifier Construction	20.0	35	1,400	188.91	21.05	18.19	0.147	1.35
Egg-Shaped Digester Demolition*	20.0	20	800	107.95	12.03	10.40	0.084	0.77
Egg-Shaped Digester Excavation*	20.0	30	1,200	161.92	18.04	15.59	0.126	1.15
Egg-Shaped Digester Foundation*	20.0	30	1,200	161.92	18.04	15.59	0.126	1.15
Egg-Shaped Digester Construction (1)	20.0	100	4,000	539.73	60.15	51.98	0.419	3.84
Sludge Drying Building Demolition	20.0	20	800	107.95	12.03	10.40	0.084	0.77
Biosolids Handling Grading**	20.0	10	400	53.97	6.01	5.20	0.042	0.38
Biosolids Handling Construction**	20.0	45	1,800	242.88	27.07	23.39	0.188	1.73

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor

**HAUL TRUCKS (off site)**

Construction Phase	# of Haul Loads per Day	Haul Truck		Haul Truck VMT/day	Emissions (ppd)				
		Trip Length (one way)			CO	ROG	NOX	SOX	PM10
Demolition - parking lot (3)	11	32		704	15.04	1.81	20.40	0.03	0.38
Demolition - admin bldg & old lab bldg (4)	61	32		3,893	83.18	10.04	112.81	0.15	2.13
Clarifier Excavation	36	32		2,304	49.22	5.94	66.76	0.09	1.26
Clarifier Construction (1)	17	15		519	11.09	1.34	15.04	0.02	0.28
Egg-Shaped Digester Demolition	3	32		192	4.10	0.49	5.56	0.01	0.10
Egg-Shaped Digester Excavation	152	20		6,080	129.90	15.67	176.17	0.23	3.32
Egg-Shaped Digester Foundation (1)	28	15		840	17.95	2.17	24.34	0.03	0.46
Egg-Shaped Digester Construction (2)	10	20		400	8.55	1.03	11.59	0.02	0.22
Sludge Drying Building Demolition	3	32		192	4.10	0.49	5.56	0.01	0.10
Biosolids Handling Grading	8	32		512	10.94	1.32	14.84	0.02	0.28
Biosolids Handling Construction	37	15		1,110	23.71	2.86	32.16	0.04	0.61

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor

(1) Concrete Trucks, not Haul Trucks

(2) Supply trucks.

(3) 1100 cy/20 cy per truck

(4) 53,534 cy/ 20 cy per truck

**PROJECT NAME:** Hyperion Full Expansion  
**PROJECT #:** 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5)^1.3, G=Wind Speed (mph)	(H/2)^1.4, H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2)^1.4, H=Moisture Content	PM10 Emissions (w/Rule 403)
Demolition - parking lot	1,100.0	5	220.0	275	550,000	2.15	1.00	0.66	9.52	0.07
Demolition - admin bldg & old lab bldg	53,534.0	44	1,216.7	1,521	3,041,705	2.15	1.00	3.66	9.52	0.38
Clarifier Excavation	86,667.0	120	722.2	903	1,805,563	2.15	1.00	2.17	9.52	0.23
Clarifier Construction	-	-	-	-	-	2.15	1.00	-	9.52	-
Egg-Shaped Digester Demolition	5,009.0	72	69.6	87	173,924	2.15	1.00	0.21	9.52	0.02
Egg-Shaped Digester Excavation	219,375.0	144	1,523.4	1,904	3,808,594	2.15	1.00	4.58	9.52	0.48
Egg-Shaped Digester Foundation	-	-	-	-	-	2.15	1.00	-	9.52	-
Egg-Shaped Digester Construction	-	-	-	-	-	2.15	1.00	-	9.52	-
Sludge Drying Building Demolition	226,666.7	72	3,148.1	3,935	7,870,370	2.15	1.00	9.46	9.52	0.99
Biosolids Handling Grading	1,613.3	22	73.3	92	183,333	2.15	1.00	0.22	9.52	0.02
Biosolids Handling Construction	-	-	-	-	-	-	-	-	-	-

SCAQMD CEQA Handbook Table 9-9-G: PM10 emissions = 0.001120 \* (G / 5) ^ 1.3) / (H / 2) ^ 1.4) \* (I / 2000)

**Dirt Pushing (on site)**

Construction Phase	Hours of Dirt Pushing Operations	PM10 Emissions (w/o Rule 403)	PM10 Emissions (w/Rule 403)
Demolition - parking lot	0	0.00	0.00
Demolition - admin bldg & old lab bldg	0	0.00	0.00
Clarifier Excavation	13	283.91	29.83
Clarifier Construction	0	0.00	0.00
Egg-Shaped Digester Demolition	0	0.00	0.00
Egg-Shaped Digester Excavation	13	283.91	29.83
Egg-Shaped Digester Foundation	0	0.00	0.00
Egg-Shaped Digester Construction	0	0.00	0.00
Sludge Drying Building Demolition	0	0.00	0.00
Biosolids Handling Grading	13	283.91	29.83
Biosolids Handling Construction	0	0.00	0.00

SCAQMD CEQA Handbook Table A9-9-F: PM10 emissions = 0.45 \* (((silt content) ^ 1.5) / (soil moisture content)^1.4)) \* 2.2046 \* hours of pushing operation

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/Rule 403)
Demolition - parking lot	0.10	2.20	18.32	45%	40%	6.05
Demolition - admin bldg & old lab bldg	0.10	12.17	101.31	45%	40%	33.43
Clarifier Excavation	0.10	7.20	59.96	45%	40%	19.79
Clarifier Construction (1)	0.10	3.46	28.81	45%	40%	9.51
Egg-Shaped Digester Demolition	0.10	0.60	5.00	45%	40%	1.65
Egg-Shaped Digester Excavation	0.10	30.40	253.14	45%	40%	83.54
Egg-Shaped Digester Foundation	0.10	5.60	46.63	45%	40%	15.39
Egg-Shaped Digester Construction	0.10	2.00	16.65	45%	40%	5.50
Sludge Drying Building Demolition	0.10	0.60	5.00	45%	40%	1.65
Biosolids Handling Grading	0.10	1.60	13.32	45%	40%	4.40
Biosolids Handling Construction	0.10	7.40	61.62	45%	40%	20.33

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads  
 SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigation measure 1) \* (1 - percent efficiency of mitigation measure 2)  
**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)

**PROJECT NAME:** Hyperion Full Expansion

**PROJECT #:** 2004-076

**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

PROJECT NAME: Hyperion Full Expansion  
 PROJECT #: 2004-076

TOTAL DAILY EMISSIONS (ppd)								
Construction Phase	CO	ROG	NOX	NOx w/ mitigation	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/ Rule 403 and mitigation)
Demolition - parking lot	84	12	59	54	6	23	10	8
Demolition - admin bldg & old lab bldg	207	26	156	152	6	111	40	38
Clarifier Excavation	352	48	219	201	21	358	62	56
Clarifier Construction	221	27	81	75	10	34	14	12
Egg-Shaped Digester Demolition	155	19	76	67	12	10	7	4
Egg-Shaped Digester Excavation	349	48	310	293	20	556	128	122
Egg-Shaped Digester Foundation	231	33	148	133	15	56	25	20
Egg-Shaped Digester Construction	597	73	172	157	16	28	17	12
Sludge Drying Building Demolition	143	17	49	44	6	9	5	4
Biosolids Handling Grading	77	10	48	44	5	300	37	36
Biosolids Handling Construction	287	35	96	90	6	68	26	24

Concurrent activities:Secondary Clarifier Module Construction, Clarifier Excavation, & Biosolids Handling Construction (Jan to June 2010)	859	110	397	366	37	459	103	93
Concurrent activities:Secondary Clarifier Module Construction & Clarifier Excavation (July to Dec 2011) - Alt 1	573	75	301	276	31	392	76	69

**NOTES:**

	w/o mitigation	with mitigation
Average Wind Speed (mph)	9.00	9.00
Moisture Content	2%	10%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34

/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1  
 /b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height  
 /c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2

**PROJECT NAME:** Hyperion Full Expansion  
**PROJECT #:** 2004-076

**ANNUAL EMISSIONS (tons per year)**

Construction Phase	CO	ROG	NOX	NOx w/ mitigation	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/ Rule 403 and mitigation)
<b>2008</b>								
Demolition - parking lot	0	0	0	0	0	0	0	0
Clarifier Excavation (1st module)	21	3	13	12	1	21	4	3
Clarifier Construction (1st module)	1	0	0	0	0	0	0	0
Sludge Drying Building Demolition	5	1	2	2	0	0	0	0
Biosolids Handling Grading	1	0	1	0	0	3	0	0
Biosolids Handling Construction	5	1	2	2	0	1	0	0
<b>Total</b>	<b>34</b>	<b>4</b>	<b>18</b>	<b>16</b>	<b>2</b>	<b>27</b>	<b>5</b>	<b>4</b>
<b>2009</b>								
Clarifier Construction (1st module)	29	4	11	10	1	4	2	2
Biosolids Handling Construction	37	5	12	12	1	9	3	3
<b>Total</b>	<b>66</b>	<b>8</b>	<b>23</b>	<b>21</b>	<b>2</b>	<b>13</b>	<b>5</b>	<b>5</b>
<b>2010</b>								
Demolition - admin & Lab bldg	5	1	3	3	0	2	1	1
Clarifier Construction (1st module)	15	2	5	5	1	2	1	1
Clarifier Excavation (2nd module)	21	3	13	12	1	21	4	3
Clarifier Construction (2nd module)	11	1	4	4	0	2	1	1
Biosolids Handling Construction	19	2	6	6	0	4	2	2
Biosolids Handling Construction	70	9	32	30	3	32	8	7
<b>Total</b>	<b>139</b>	<b>18</b>	<b>64</b>	<b>60</b>	<b>6</b>	<b>64</b>	<b>16</b>	<b>14</b>
<b>or</b>								
Clarifier Construction (1st module)	15	2	5	5	1	2	1	1
Demolition - parking lot	0	0	0	0	0	0	0	0
Clarifier Excavation (2nd module)	1	0	1	1	0	1	0	0
Clarifier Construction (2nd module)	15	2	6	5	1	2	1	1
Biosolids Handling Construction	19	2	6	6	0	4	2	2
<b>Total</b>	<b>50</b>	<b>6</b>	<b>18</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>4</b>	<b>3</b>
<b>2011</b>								
Clarifier Construction (2nd module)	29	4	11	10	1	4	2	2
Demolition - parking lot	0	0	0	0	0	0	0	0
Clarifier Excavation (3rd module)	21	3	13	12	1	21	4	3
Clarifier Construction (3rd module)	1	0	0	0	0	0	0	0
<b>Total</b>	<b>51</b>	<b>7</b>	<b>24</b>	<b>22</b>	<b>3</b>	<b>26</b>	<b>6</b>	<b>5</b>
<b>2012 (2011 for Alt 3 and 4)</b>								
Clarifier Construction (3rd module)	29	4	11	10	1	4	2	2
<b>Total</b>	<b>29</b>	<b>4</b>	<b>11</b>	<b>10</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>2</b>
<b>2013</b>								
Clarifier Construction (3rd module)	15	2	5	5	1	2	1	1
<b>Total</b>	<b>15</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>2014</b>								
Digester Demolition	6	1	3	2	0	0	0	0
Digester Excavation	10	1	9	9	1	17	4	4
<b>Total</b>	<b>16</b>	<b>2</b>	<b>12</b>	<b>11</b>	<b>1</b>	<b>17</b>	<b>4</b>	<b>4</b>
<b>2015</b>								
Digester Excavation	15	2	13	12	1	23	5	5
Digester Foundation	20	3	13	12	1	5	2	2
<b>Total</b>	<b>35</b>	<b>5</b>	<b>26</b>	<b>24</b>	<b>2</b>	<b>28</b>	<b>8</b>	<b>7</b>
<b>2016 through 2019</b>								
Digester Construction	78	9	22	20	2	4	2	2
<b>Total</b>	<b>78</b>	<b>9</b>	<b>22</b>	<b>20</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>2</b>
<b>2020</b>								
Digester Construction	39	5	11	10	1	2	1	1

**PROJECT NAME:** Hyperion Full Expansion

**PROJECT #:** 2004-076

<i>Total</i>	39	5	11	10	1	2	1	1
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PROJECT NAME: Tillman100  
 PROJECT #: 2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0213647	0.0025777	0.0289760	0.0000384	0.0005467
Light Duty Cars (Worker Vehicle)	0.1349322	0.0150368	0.0129952	0.0001046	0.0009610
<b>Assumptions:</b>					
Construction Year	2008				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.469	0.086	1.029	0.243	0.055
Backhoe/Loader	0.420	0.122	0.799	0.115	0.083
Loader	0.420	0.122	0.799	0.115	0.083
Crane	0.350	0.080	0.941	0.196	0.049
Fork Lift	0.254	0.074	0.432	-	0.048
Concrete Pump	0.046	0.01	0.072	-	0.005
Compressor/Generator	0.315	0.090	0.635	0.001	0.047
Power Tools	0.534	0.115	1.336	0.223	0.063
Source: South Coast Air Quality Management District (SCAQMD)					

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Worker Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>
Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook **Note: Weighted average based on travel characteristics		

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor $(2.1)(G/12)(H/30)((J/3)^{0.7})((I/4)^{0.5})((365-K)/365)$	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

PROJECT NAME: Tillman100  
 PROJECT #: 2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Primary Clarifier Excavation</b>							
Crane	1	13	9.1	2.08	24.47	5.10	1.27
Excavator	2	13	12.194	2.24	26.75	6.32	1.43
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	1	13	3.302	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.095	1.17	8.26	0.01	0.61
Power Tools	2	13	13.884	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>50.53</b>	<b>12.79</b>	<b>106.64</b>	<b>17.41</b>	<b>8.26</b>
<b>Primary Clarifier Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>41.89</b>	<b>10.09</b>	<b>92.09</b>	<b>13.01</b>	<b>6.06</b>
<b>Aeration Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>59.87</b>	<b>14.74</b>	<b>129.14</b>	<b>20.66</b>	<b>9.26</b>
<b>Aeration Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>41.89</b>	<b>10.09</b>	<b>92.09</b>	<b>13.01</b>	<b>6.06</b>
<b>Secondary Clarifier Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>59.87</b>	<b>14.74</b>	<b>129.14</b>	<b>20.66</b>	<b>9.26</b>
<b>Secondary Clarifier Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>41.89</b>	<b>10.09</b>	<b>92.09</b>	<b>13.01</b>	<b>6.06</b>
<b>Wet Weather Storage Excavation</b>							
Crane	2	13	9.10	2.08	24.47	5.10	1.27
Excavator	3	13	18.29	3.35	40.13	9.48	2.15
Loader	5	13	27.30	7.93	51.94	7.48	5.40
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>16</b>		<b>77.17</b>	<b>18.75</b>	<b>167.01</b>	<b>27.86</b>	<b>11.82</b>
<b>Wet Weather Storage Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
<b>Total</b>	<b>5</b>		<b>16.67</b>	<b>4.47</b>	<b>34.88</b>	<b>5.54</b>	<b>2.93</b>
<b>Microfiltration and Advanced Treatment</b>							
Backhoe/Loader	1	13	5.46	1.59	10.39	1.50	1.08
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
<b>Total</b>	<b>4</b>		<b>18.77</b>	<b>5.17</b>	<b>38.62</b>	<b>5.54</b>	<b>3.42</b>

equipment emissions = # equipment \* hours of use \* emissions factor

PROJECT NAME: Tillman100  
 PROJECT #: 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)						
	CO	ROG	NOX	NOx w/ mit	SOX	PM10	PM10 w/ mit
Primary Clarifier Excavation	50.53	12.79	106.64	14.93	17.41	8.26	1.04
Primary Clarifier Construction	41.89	10.09	92.09	12.89	13.01	6.06	0.76
Aeration Excavation	59.87	14.74	129.14	18.08	20.66	9.26	1.17
Aeration Construction	41.89	10.09	92.09	12.89	13.01	6.06	0.76
Secondary Clarifier Excavation	59.87	14.74	129.14	18.08	20.66	9.26	1.17
Secondary Clarifier Construction	41.89	10.09	92.09	12.89	13.01	6.06	0.76
Wet Weather Storage Excavation	77.17	18.75	167.01	23.38	27.86	11.82	1.49
Wet Weather Storage Construction	16.67	4.47	34.88	4.88	5.54	2.93	0.37
Filtration and Advanced Treatment	18.77	5.17	38.62	5.41	5.54	3.42	0.43

equipment emissions = # equipment \* hours of use \* emissions factor  
 Mitigation Measure 1: Use of emulsified diesel fuel on construction equipment (reduces NOx and PM10 emissions)  
 Mitigation Measure 2: Use of diesel particulate filter on construction equipment (reduces PM10 emissions)

Construction Phase	WORKER VEHICLES (off site)			Emissions (ppd)				
	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	CO	ROG	NOX	SOX	PM10
Primary Clarifier Excavation	20.0	30	1,200	161.92	18.04	15.59	0.126	1.15
Primary Clarifier Construction	20.0	50	2,000	269.86	30.07	25.99	0.209	1.92
Aeration Excavation	20.0	30	1,200	161.92	18.04	15.59	0.126	1.15
Aeration Construction	20.0	50	2,000	269.86	30.07	25.99	0.209	1.92
Secondary Clarifier Excavation	20.0	30	1,200	161.92	18.04	15.59	0.126	1.15
Secondary Clarifier Construction	20.0	50	2,000	269.86	30.07	25.99	0.209	1.92
Wet Weather Storage Excavation	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Wet Weather Storage Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Filtration and Advanced Treatment	20.0	15	600	80.96	9.02	7.80	0.063	0.58

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor

**HAUL TRUCKS (off site)**

Construction Phase	Haul Truck			Emissions (ppd)				
	# of Haul Loads per Day	Trip Length (one way)	Haul Truck VMT/day	CO	ROG	NOX	SOX	PM10
Primary Clarifier Excavation	36	25	1,800	38.46	4.64	52.16	0.07	0.98
Primary Clarifier Construction (1)	17	10	340	7.26	0.88	9.85	0.01	0.19
Primary Clarifier Construction - Supply	35	20	1,400	29.91	3.61	40.57	0.05	0.77
Aeration Excavation	36	25	1,800	38.46	4.64	52.16	0.07	0.98
Aeration Construction (1)	17	10	340	7.26	0.88	9.85	0.01	0.19
Aeration Construction - Supply	35	20	1,400	29.91	3.61	40.57	0.05	0.77
Secondary Clarifier Excavation	36	25	1,800	38.46	4.64	52.16	0.07	0.98
Secondary Clarifier Construction (1)	17	10	340	7.26	0.88	9.85	0.01	0.19
Secondary Clarifier Construction - Supply	35	20	1,400	29.91	3.61	40.57	0.05	0.77
Wet Weather Storage Excavation	121	25	6,050	129.26	15.59	175.30	0.23	3.31
Wet Weather Storage Construction (1)	41	20	1,640	35.04	4.23	47.52	0.06	0.90
Wet Weather Storage Construction -Supply	39	20	1,560	33.33	4.02	45.20	0.06	0.85
Filtration and Advanced Treatment (1)	40	20	1,600	34.18	4.12	46.36	0.06	0.87

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor  
 (1) Concrete trucks, not haul trucks

PROJECT NAME: Tillman100  
 PROJECT #: 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5) <sup>1.3</sup> , G=Wind Speed (mph)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/Rule 403)
Primary Clarifier Excavation	12,326.0	17	725.1	906	1,812,647	2.15	1.00	2.18	9.52	0.23
Primary Clarifier Construction			-	-	-					
Aeration Excavation	41,600.0	57	729.8	912	1,824,561	2.15	1.00	2.19	9.52	0.23
Aeration Construction			-	-	-		1.00	-	9.52	-
Secondary Clarifier Excavation	32,933.0	46	715.9	895	1,789,837	2.15	1.00	2.15	9.52	0.23
Secondary Clarifier Construction			-	-	-					
Wet Weather Storage Excavation	530,833.0	220	2,412.9	3,016	6,032,193	2.15	1.00	7.25	9.52	0.76
Wet Weather Storage Construction	-		-	-	-					
Filtration and Advanced Treatment	720.0	2	360.0	450	900,000	2.15	1.00	1.08	9.52	0.11

SCAQMD CEQA Handbook Table 9-9-G: PM10 emissions = 0.001120 \* (G / 5) ^ 1.3 / (H / 2) ^ 1.4 \* (I / 2000)

**Dirt Pushing (on site)**

Construction Phase	Hours of Dirt Pushing Operations	PM10 Emissions (w/o Rule 403)	PM10 Emissions (w/Rule 403)
Primary Clarifier Excavation	13	283.91	29.83
Primary Clarifier Construction	0	0.00	0.00
Aeration Excavation	13	283.91	29.83
Aeration Construction	0	0.00	0.00
Secondary Clarifier Excavation	13	283.91	29.83
Secondary Clarifier Construction	0	0.00	0.00
Wet Weather Storage Excavation	13	283.91	29.83
Wet Weather Storage Construction	0	0.00	0.00
Filtration and Advanced Treatment	13	283.91	29.83

SCAQMD CEQA Handbook Table A9-9-F: PM10 emissions = 0.45 \* (((silt content) ^ 1.5) / (soil moisture content)<sup>1.4</sup>) \* 2.2046  
 \* hours of pushing operation

**PROJECT NAME:** Tillman100  
**PROJECT #:** 2004-076

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/Rule 403)
Primary Clarifier Excavation	0.10	7.20	59.96	45%	40%	19.79
Primary Clarifier Construction	0.10	3.40	28.31	45%	40%	9.34
Aeration Excavation	0.10	7.20	59.96	45%	40%	19.79
Aeration Construction	0.10	3.40	28.31	45%	40%	9.34
Secondary Clarifier Excavation	0.10	7.20	59.96	45%	40%	19.79
Secondary Clarifier Construction	0.10	3.40	28.31	45%	40%	9.34
Wet Weather Storage Excavation	0.10	24.20	201.52	45%	40%	66.50
Wet Weather Storage Construction	0.10	8.20	68.28	45%	40%	22.53
Filtration and Advanced Treatment	0.10	8.20	68.28	45%	40%	22.53

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads  
 SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigation measure 1) \* (1 - percent efficiency of mitigation measure 2)  
**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)  
**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

TOTAL EMISSIONS								
Construction Phase	CO	ROG	NOX	NOX w/ mitigation	SOX	PM10 (w/o mitigation)	PM10 (w/ Rule 403)	PM10 (w/ Rule 403 and mitigation)
Primary Clarifier Excavation	251	35	174	83	18	356	60	53
Primary Clarifier Construction	349	45	169	89	13	37	18	12
Aeration Excavation	260	37	197	86	21	357	61	53
Aeration Construction	349	45	169	89	13	37	18	13
Secondary Clarifier Excavation	260	37	197	86	21	74	60	52
Secondary Clarifier Construction	349	45	169	89	13	320	18	13
<b>Maximum Emissions /a/</b>	1,092	145	627	270	106	205	151	78

/a/ assumes overlapping construction of primary clarifier construction, aeration construction, secondary clarifier excavation, and filtration & advanced treatment (July 2015 - Dec 2016)

Tillman Process Upgrades and Storage								
Construction Phase	CO	ROG	NOX	NOX w/ mitigation	SOX	PM10 (w/o mitigation)	PM10 (w/ Rule 403)	PM10 (w/ Rule 403 and mitigation)
Wet Weather Storage Excavation	341	49	355	212	28	21	113	103
Wet Weather Storage Construction	220	28	141	111	6	5	28	26
Filtration and Advanced Treatment	134	18	93	60	6	58	57	54
<b>Maximum Emissions /b/</b>	354	46	233	170	11	63	86	80

/b/ assumes storage construction occurs simultaneously with filtration and adv. treatment installation (July 2009 - June 2010)

Tillman Process Storage /c/								
Construction Phase	CO	ROG	NOX	NOX w/ mitigation	SOX	PM10 (w/o mitigation)	PM10 (w/ Rule 403)	PM10 (w/ Rule 403 and mitigation)
	341	49	355	212	28	21	113	103

/c/ maximum daily emissions from excavation or construction of storage. The phases would occur independently.

**NOTES:**

	w/o mitigation	with mitigation
Average Wind Speed (mph)	9.00	9.00
Moisture Content	2%	10%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34

/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1  
 /b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height  
 /c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2

PROJECT NAME: Tillman100  
 PROJECT #: 2004-076

ANNUAL EMISSIONS (tons per year)

Construction Phase	CO	ROG	NOX	NOx w/ mitigation	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/ Rule 403 and mitigation)
<b>TILLMAN 100 MGD</b>								
<b>2009 through 2011</b>								
MF/RO	17	2	12	8	1	8	7	7
<i>Total</i>	17	2	12	8	1	8	7	7
<b>2012</b>								
MF/RO	17	2	12	8	1	8	7	7
Secondary Clarifier Excavation	6	1	5	2	0	2	1	1
Secondary Clarifier Construction	15	2	7	4	1	14	1	1
<i>Total</i>	38	5	24	14	2	23	10	9
<b>2013</b>								
MF/RO	17	2	12	8	1	8	7	7
Secondary Clarifier Construction	45	6	22	12	2	42	2	2
<i>Total</i>	63	8	34	19	2	49	10	9
<b>2014</b>								
MF/RO	73	10	41	21	3	36	10	8
Secondary Clarifier Excavation	0	0	0	0	0	0	0	0
Secondary Clarifier Construction	17	2	12	8	1	8	7	7
Aeration Basin Excavation	45	6	22	12	2	42	2	2
Aeration Basin Construction	45	6	22	12	2	5	2	2
Primary Clarifier Excavation	45	6	22	12	2	5	2	2
Primary Clarifier Construction	153	20	78	43	6	59	14	12
<i>Total</i>	380	49	197	107	15	154	39	33
<b>2015 &amp; 2016</b>								
MF/RO	17	2	12	8	1	8	7	7
Secondary Clarifier Construction	45	6	22	12	2	42	2	2
Aeration Basin Construction	45	6	22	12	2	5	2	2
Primary Clarifier Construction	45	6	22	12	2	5	2	2
<i>Total</i>	153	20	78	43	6	59	14	12
<b>TILLMAN STORAGE</b>								
<b>2008</b>								
Wet Weather Storage Excavation	38	5	39	23	3	2	12	11
Wet Weather Storage Construction	4	1	3	2	0	0	1	1
<i>Total</i>	42	6	42	25	3	2	13	12
<b>2009</b>								
Wet Weather Storage Construction	29	4	18	14	1	1	4	3
<i>Total</i>	29	4	18	14	1	1	4	3
<b>2010</b>								
Wet Weather Storage Construction	15	2	9	7	0	0	2	2
<i>Total</i>	15	2	9	7	0	0	2	2

PROJECT NAME: Tillman 80  
 PROJECT #: 2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0213647	0.0025777	0.0289760	0.0000384	0.0005467
Light Duty Cars (Worker Vehicle)	0.1349322	0.0150368	0.0129952	0.0001046	0.0009610
<b>Assumptions:</b>					
Construction Year	2008				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.469	0.086	1.029	0.243	0.055
Backhoe/Loader	0.420	0.122	0.799	0.115	0.083
Loader	0.420	0.122	0.799	0.115	0.083
Crane	0.350	0.080	0.941	0.196	0.049
Fork Lift	0.254	0.074	0.432	-	0.048
Concrete Pump	0.046	0.01	0.072	-	0.005
Compressor/Generator	0.315	0.090	0.635	0.001	0.047
Power Tools	0.534	0.115	1.336	0.223	0.063
Source: South Coast Air Quality Management District (SCAQMD)					

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Worker Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>
Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook **Note: Weighted average based on travel characteristics		

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor $(2.1)(G/12)(H/30)((J/3)^{0.7})((I/4)^{0.5})((365-K)/365)$	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

PROJECT NAME:  
PROJECT #:

Tillman 80  
2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Secondary Clarifier Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>59.87</b>	<b>14.74</b>	<b>129.14</b>	<b>20.66</b>	<b>9.26</b>
<b>Secondary Clarifier Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>41.89</b>	<b>10.09</b>	<b>92.09</b>	<b>13.01</b>	<b>6.06</b>
<b>Wet Weather Storage Excavation</b>							
Crane	2	13	9.10	2.08	24.47	5.10	1.27
Excavator	3	13	18.29	3.35	40.13	9.48	2.15
Loader	5	13	27.30	7.93	51.94	7.48	5.40
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>16</b>		<b>77.17</b>	<b>18.75</b>	<b>167.01</b>	<b>27.86</b>	<b>11.82</b>
<b>Wet Weather Storage Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
<b>Total</b>	<b>5</b>		<b>16.67</b>	<b>4.47</b>	<b>34.88</b>	<b>5.54</b>	<b>2.93</b>
<b>Microfiltration and Advanced Treatment</b>							
Backhoe/Loader	1	13	5.46	1.59	10.39	1.50	1.08
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
<b>Total</b>	<b>4</b>		<b>18.77</b>	<b>5.17</b>	<b>38.62</b>	<b>5.54</b>	<b>3.42</b>

equipment emissions = # equipment \* hours of use \* emissions factor

**PROJECT NAME:** Tillman 80  
**PROJECT #:** 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)						
	CO	ROG	NOX	NOX w/ mit	SOX	PM10	PM10 w/ mit
Secondary Clarifier Excavation	59.87	14.74	129.14	18.08	20.66	9.26	1.17
Secondary Clarifier Construction	41.89	10.09	92.09	12.89	13.01	6.06	0.76
Wet Weather Storage Excavation	77.17	18.75	167.01	23.38	27.86	11.82	1.49
Wet Weather Storage Construction	16.67	4.47	34.88	4.88	5.54	2.93	0.37
Filtration and Advanced Treatment	18.77	5.17	38.62	5.41	5.54	3.42	0.43

equipment emissions = # equipment \* hours of use \* emissions factor  
 Mitigation Measure 1: Use of emulsified diesel fuel on construction equipment (reduces NOx and PM10 emissions)  
 Mitigation Measure 2: Use of diesel particulate filter on construction equipment (reduces PM10 emissions)

**WORKER VEHICLES (off site)**

Construction Phase	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Secondary Clarifier Excavation	20.0	30	1,200	161.92	18.04	15.59	0.126	1.15
Secondary Clarifier Construction	20.0	50	2,000	269.86	30.07	25.99	0.209	1.92
Wet Weather Storage Excavation	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Wet Weather Storage Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Filtration and Advanced Treatment	20.0	15	600	80.96	9.02	7.80	0.063	0.58

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor

**HAUL TRUCKS (off site)**

Construction Phase	# of Haul Loads per Day	Haul Truck Trip Length (one way)	Haul Truck VMT/day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Secondary Clarifier Excavation	36	25	1,800	38.46	4.64	52.16	0.07	0.98
Secondary Clarifier Construction (1)	17	10	340	7.26	0.88	9.85	0.01	0.19
Secondary Clarifier Construction - Supply	35	20	1,400	29.91	3.61	40.57	0.05	0.77
Wet Weather Storage Excavation	121	25	6,050	129.26	15.59	175.30	0.23	3.31
Wet Weather Storage Construction (1)	41	20	1,640	35.04	4.23	47.52	0.06	0.90
Wet Weather Storage Construction -Supply	39	20	1,560	33.33	4.02	45.20	0.06	0.85
Filtration and Advanced Treatment (1)	40	20	1,600	34.18	4.12	46.36	0.06	0.87

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor  
 (1) Concrete trucks, not haul trucks

PROJECT NAME: Tillman 80  
 PROJECT #: 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5) <sup>1.3</sup> , G=Wind Speed (mph)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/Rule 403)
Secondary Clarifier Excavation	16,467.0	30	548.9	686	1,372,250	2.15	1.00	1.65	9.52	0.17
Secondary Clarifier Construction										
Wet Weather Storage Excavation	530,833.0	220	2,412.9	3,016	6,032,193	2.15	1.00	7.25	9.52	0.76
Wet Weather Storage Construction	-		-	-	-					
Filtration and Advanced Treatment*	720.0	2	360.0	450	900,000	2.15	1.00	1.08	9.52	0.11

SCAQMD CEQA Handbook Table 9-9-G: PM10 emissions = 0.001120 \* (G / 5) ^ 1.3 / (H / 2) ^ 1.4 \* (I / 2000)

**Dirt Pushing (on site)**

Construction Phase	Hours of Dirt Pushing Operations	PM10 Emissions (w/o Rule 403)	PM10 Emissions (w/Rule 403)
Secondary Clarifier Excavation	13	283.91	29.83
Secondary Clarifier Construction	0	0.00	0.00
Wet Weather Storage Excavation	13	283.91	29.83
Wet Weather Storage Construction	0	0.00	0.00
Filtration and Advanced Treatment	13	283.91	29.83

SCAQMD CEQA Handbook Table A9-9-F: PM10 emissions = 0.45 \* (((silt content) ^ 1.5) / (soil moisture content)<sup>1.4</sup>) \* 2.2046 \* hours of pushing operation

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/Rule 403)
Secondary Clarifier Excavation	0.10	7.20	59.96	45%	40%	19.79
Secondary Clarifier Construction	0.10	3.40	28.31	45%	40%	9.34
Wet Weather Storage Excavation	0.10	24.20	201.52	45%	40%	66.50
Wet Weather Storage Construction	0.10	8.20	68.28	45%	40%	22.53
Filtration and Advanced Treatment	0.10	8.20	68.28	45%	40%	22.53

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads  
 SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigationmeasure 1) \* (1 - percent efficiency of mitigation measure 2)  
**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)  
**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

**PROJECT NAME:** Tillman 80  
**PROJECT #:** 2004-076

<b>TOTAL EMISSIONS</b>								
<b>Construction Phase</b>	<b>CO</b>	<b>ROG</b>	<b>NOX</b>	<b>NOx w/ mitigation</b>	<b>SOX</b>	<b>PM10 (w/o mitigation)</b>	<b>PM10 (w/ mitigation)</b>	<b>PM10 (w/Rule 403 and mitigation)</b>
Secondary Clarifier Excavation	260	37	197	86	21	357	61	53
Secondary Clarifier Construction	349	45	169	89	13	37	18	12
Filtration and Advanced Treatment	134	18	93	60	6	358	57	54

Concurrent Activities: Secondary Clarifier Excavation & Filtration and Advance Treatment (Beginning of 2012)	394	56	290	145	27	715	119	107
Concurrent Activities: Secondary Clarifier Construction & Filtration and Advance Treatment (middle of 2012 through Dec 2013)	483	63	261	149	19	395	75	67

<b>Tillman Process Storage</b>								
Wet Weather Storage Excavation	341	49	355	212	28	509	113	102.85
Wet Weather Storage Construction	220	28	141	111	6	74	28	25.61
<b>Maximum Emissions (Jan 2008 - July 2010)</b>	341	49	355	212	28	509	113	103

<b>Tillman Process Upgrades and Storage /b/</b>	475	68	448	271	34	867	171	157
<i>/b/ assumes storage construction occurs simultaneously with filtration and adv. treatment implementation</i>								

**NOTES:**

	<i>w/o mitigation</i>	<i>with mitigation</i>
Average Wind Speed (mph)	9.00	9.00
Moisture Content	2%	10%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34

*/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1*

*/b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height*

*/c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2*

**PROJECT NAME:**  
**PROJECT #:**

LAG 30 MGD  
2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0213647	0.0025777	0.0289760	0.0000384	0.0005467
Light Duty Cars (Worker Vehicle)	0.1349322	0.0150368	0.0129952	0.0001046	0.0009610
<b>Assumptions:</b>					
Construction Year	2008				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.469	0.086	1.029	0.243	0.055
Loader	0.420	0.122	0.799	0.115	0.083
Crane	0.350	0.080	0.941	0.196	0.049
Fork Lift	0.254	0.074	0.432	-	0.048
Concrete Pump	0.046	0.01	0.072	-	0.005
Compressor/Generator	0.315	0.090	0.635	0.001	0.047
Power Tools	0.534	0.115	1.336	0.223	0.063

Source: South Coast Air Quality Management District (SCAQMD)

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Worker Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>

Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook \*\*Note: Weighted average based on travel characteristics

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor $(2.1)(G/12)(H/30)((J/3)^{0.7})((I/4)^{0.5})((365-K)/365)$	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

PROJECT NAME: LAG 30 MGD  
 PROJECT #: 2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Primary Clarifier Excavation</b>							
Crane	1	13	9.1	2.08	24.47	5.10	1.27
Excavator	2	13	12.194	2.24	26.75	6.32	1.43
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Fork Lift	1	13	3.302	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.095	1.17	8.26	0.01	0.61
Power Tools	2	13	13.884	2.99	34.74	5.80	1.64
<b>Total</b>	<b>9</b>		<b>39.61</b>	<b>9.62</b>	<b>85.87</b>	<b>14.42</b>	<b>6.10</b>
<b>Primary Clarifier Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>41.89</b>	<b>10.09</b>	<b>92.09</b>	<b>13.01</b>	<b>6.06</b>
<b>Aeration Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	3	13	16.38	4.76	31.16	4.49	3.24
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>54.41</b>	<b>13.16</b>	<b>118.76</b>	<b>19.16</b>	<b>8.18</b>
<b>Aeration Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	1	13	5.46	1.59	10.39	1.50	1.08
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>41.89</b>	<b>10.09</b>	<b>92.09</b>	<b>13.01</b>	<b>6.06</b>
<b>Secondary Clarifier Excavation</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	3	13	16.38	4.76	31.16	4.49	3.24
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>10</b>		<b>54.41</b>	<b>13.16</b>	<b>118.76</b>	<b>19.16</b>	<b>8.18</b>
<b>Secondary Clarifier Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Excavator	1	13	6.10	1.12	13.38	3.16	0.72
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>11</b>		<b>47.35</b>	<b>11.67</b>	<b>102.48</b>	<b>14.51</b>	<b>7.14</b>
<b>Wastewater Storage Excavation</b>							
Crane	2	13	9.10	2.08	24.47	5.10	1.27
Excavator	3	13	18.29	3.35	40.13	9.48	2.15
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>16</b>		<b>75.01</b>	<b>18.12</b>	<b>162.24</b>	<b>26.36</b>	<b>11.36</b>
<b>Recycled Water Storage Excavation</b>							
Crane	2	13	9.10	2.08	24.47	5.10	1.27
Excavator	2	13	12.19	2.24	26.75	6.32	1.43
Loader	4	13	21.84	6.34	41.55	5.98	4.32
Fork Lift	2	13	6.60	1.92	11.23	0.00	1.25
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
Compressor/Generator	1	13	4.10	1.17	8.26	0.01	0.61
Power Tools	2	13	13.88	2.99	34.74	5.80	1.64
<b>Total</b>	<b>15</b>		<b>68.91</b>	<b>17.00</b>	<b>148.86</b>	<b>23.21</b>	<b>10.65</b>
<b>Wastewater Storage Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
<b>Total</b>	<b>5</b>		<b>16.67</b>	<b>4.47</b>	<b>34.88</b>	<b>5.54</b>	<b>2.93</b>
<b>Recycled Water Storage Construction</b>							
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Concrete Pump	2	13	1.20	0.26	1.87	0.00	0.13
<b>Total</b>	<b>5</b>		<b>16.67</b>	<b>4.47</b>	<b>34.88</b>	<b>5.54</b>	<b>2.93</b>
<b>Microfiltration and Reverse Osmosis Units</b>							
Loader	2	13	10.92	3.17	20.77	2.99	2.16
Crane	1	13	4.55	1.04	12.23	2.55	0.64
Fork Lift	1	13	3.30	0.96	5.62	0.00	0.62
<b>Total</b>	<b>4</b>		<b>18.77</b>	<b>5.17</b>	<b>38.62</b>	<b>5.54</b>	<b>3.42</b>

equipment emissions = # equipment \* hours of use \* emissions factor

PROJECT NAME: LAG 30 MGD  
 PROJECT #: 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)						
	CO	ROG	NOX	NOx w/mit	SOX	PM10	PM10 w/ mit
Primary Clarifier Excavation	39.61	9.62	85.87	12.02	14.42	6.10	0.77
Primary Clarifier Construction	41.89	10.09	92.09	12.89	13.01	6.06	0.76
Aeration Excavation	54.41	13.16	118.76	16.63	19.16	8.18	1.03
Aeration Construction	41.89	10.09	92.09	12.89	13.01	6.06	0.76
Secondary Clarifier Excavation	54.41	13.16	118.76	16.63	19.16	8.18	1.03
Secondary Clarifier Construction	47.35	11.67	102.48	14.35	14.51	7.14	0.90
Wastewater Storage Excavation	75.01	18.12	162.24	22.71	26.36	11.36	1.43
Wastewater Storage Construction	16.67	4.47	34.88	4.88	5.54	2.93	0.37
Recycled Water Storage Excavation	68.91	17.00	148.86	20.84	23.21	10.65	1.34
Recycled Water Storage Construction	16.67	4.47	34.88	4.88	5.54	2.93	0.37
Filtration and Adv. Treatment	18.77	5.17	38.62	5.41	5.54	3.42	0.43

equipment emissions = # equipment \* hours of use \* emissions factor  
 Mitigation Measure 1: Use of emulsified diesel fuel on construction equipment (reduces NOx and PM10 emissions)  
 Mitigation Measure 2: Use of diesel particulate filter on construction equipment (reduces PM10 emissions)

Construction Phase	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Primary Clarifier Excavation	20.0	40	1,600	215.89	24.06	20.79	0.167	1.54
Primary Clarifier Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Aeration Excavation	20.0	40	1,600	215.89	24.06	20.79	0.167	1.54
Aeration Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Secondary Clarifier Excavation	20.0	40	1,600	215.89	24.06	20.79	0.167	1.54
Secondary Clarifier Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Wastewater Storage Excavation	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Wastewater Storage Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Recycled Water Storage Excavation	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Recycled Water Storage Construction	20.0	25	1,000	134.93	15.04	13.00	0.105	0.96
Filtration and Adv. Treatment	20.0	15	600	80.96	9.02	7.80	0.06	0.58

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor

**HAUL TRUCKS (off site)**

Construction Phase	# of Haul Loads per Day	Haul Truck Trip Length (one way)	Haul Truck VMT/day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Primary Clarifier Excavation	46	25	2,300	49.14	5.93	66.64	0.09	1.26
Primary Clarifier Construction	37	10	740	15.81	1.91	21.44	0.03	0.40
Primary Clarifier Construction - Supply	47	20	1,880	40.17	4.85	54.47	0.07	1.03
Aeration Excavation	46	25	2,300	49.14	5.93	66.64	0.09	1.26
Aeration Construction	37	10	740	15.81	1.91	21.44	0.03	0.40
Aeration Construction - Supply	47	20	1,880	40.17	4.85	54.47	0.07	1.03
Secondary Clarifier Excavation	46	25	2,300	49.14	5.93	66.64	0.09	1.26
Secondary Clarifier Construction	37	10	740	15.81	1.91	21.44	0.03	0.40
Secondary Clarifier Construction - Supply	47	20	1,880	40.17	4.85	54.47	0.07	1.03
Wastewater Storage Excavation	42	25	2,100	44.87	5.41	60.85	0.08	1.15
Wastewater Storage Construction	34	10	680	14.53	1.75	19.70	0.03	0.37
Wastewater Storage Construction - Supply	41	20	1,640	35.04	4.23	47.52	0.06	0.90
Recycled Water Storage Excavation	42	25	2,100	44.87	5.41	60.85	0.08	1.15
Recycled Water Storage Construction	34	10	680	14.53	1.75	19.70	0.03	0.37
Recycled Water Storage Construction - Supply	41	20	1,640	35.04	4.23	47.52	0.06	0.90
Filtration and Adv. Treatment	40	20	1,600	34.18	4.12	46.36	0.06	0.87

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor

PROJECT NAME: LAG 30 MGD

PROJECT #: 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on-site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5) <sup>1.3</sup> , G=Wind Speed (mph)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/Rule 403)
Primary Clarifier Excavation	8089	9	898.8	1,123	2,246,944	2.15	1.00	2.70	9.52	0.28
Primary Clarifier Construction			-	-	-	2.15	1.00	-	9.52	-
Aeration Excavation	31,200.0	33	945.5	1,182	2,363,636	2.15	1.00	2.84	9.52	0.30
Aeration Construction			-	-	-	2.15	1.00	-	9.52	-
Secondary Clarifier Excavation	11,459.0	12	954.9	1,194	2,387,292	2.15	1.00	2.87	9.52	0.30
Secondary Clarifier Construction			-	-	-	2.15	1.00	-	9.52	-
Wastewater Storage Excavation (1)	20,961.5	23	911.4	1,139	2,278,424	2.15	1.00	2.74	9.52	0.29
Wastewater Storage Construction			-	-	-			-		-
Recycled Water Storage (1)	20,961.5	23	911.4	1,139	2,278,424	2.15	1.00	2.74	9.52	0.29
Recycled Water Storage Construction			-	-	-			-		-
Filtration and Adv. Treatment	720.0	2	360.0	450	900,000	2.15	1.00	1.08	9.52	0.11

SCAQMD CEQA Handbook Table 9-9-G: PM10 emissions = 0.001120 \* (G / 5) ^ 1.3 / (H / 2) ^ 1.4 \* (I / 2000)

(1) Assumes the total 41923 CY excavated is split between the two 5 MG storage tanks.

**Dirt Pushing (on site)**

Construction Phase	Hours of Dirt Pushing Operations	PM10 Emissions (w/o Rule 403)	PM10 Emissions (w/Rule 403)
Primary Clarifier Excavation	13	283.91	29.83
Primary Clarifier Construction	0	0.00	0.00
Aeration Excavation	13	283.91	29.83
Aeration Construction	0	0.00	0.00
Secondary Clarifier Excavation	13	283.91	29.83
Secondary Clarifier Construction	0	0.00	0.00
Wastewater Storage Excavation	13	283.91	29.83
Wastewater Storage Construction	0	0.00	0.00
Recycled Water Storage Excavation	13	283.91	29.83
Recycled Water Storage Construction	0	0.00	0.00
Filtration and Adv. Treatment	13	283.91	29.83

SCAQMD CEQA Handbook Table A9-9-F: PM10 emissions = 0.45 \* (((silt content) ^ 1.5) / (soil moisture content)<sup>1.4</sup>) \* 2.2046 \* hours of pushing operation

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/Rule 403)
Primary Clarifier Excavation	0.10	9.20	76.61	45%	40%	25.28
Primary Clarifier Construction	0.10	7.40	61.62	45%	40%	20.33
Aeration Excavation	0.10	9.20	76.61	45%	40%	25.28
Aeration Construction	0.10	7.40	61.62	45%	40%	20.33
Secondary Clarifier Excavation	0.10	9.20	76.61	45%	40%	25.28
Secondary Clarifier Construction	0.10	7.40	61.62	45%	40%	20.33
Wastewater Storage Excavation	0.10	8.40	69.95	45%	40%	23.08
Wastewater Storage Construction	0.10	6.80	56.62	45%	40%	18.69
Recycled Water Storage	0.10	8.20	68.28	45%	40%	22.53
Recycled Water Storage Construction	0.10	8.40	69.95	45%	40%	23.08
Filtration and Adv. Treatment	0.10	8.40	69.95	45%	40%	23.08

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads

SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigation measure 1) \* (1 - percent efficiency of mitigation measure 2)

**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)

**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

PROJECT NAME: LAG 30 MGD  
 PROJECT #: 2004-076

TOTAL EMISSIONS									
Construction Phase	CO	ROG	NOX	NOx w/ mitigation	SOX	PM10 (w/o mitigation)	PM10 (w/ mitigation)	PM10 (w/ Rule 403 and mitigation)	
Primary Clarifier Excavation	305	40	173	99	15	372	64	59	
Primary Clarifier Construction	233	32	181	102	13	70	28	22	
Aeration Excavation	319	43	206	104	19	374	66	59	
Aeration Construction	233	32	181	102	13	70	29	23	
Secondary Clarifier Excavation	319	43	206	104	19	374	66	58	
Secondary Clarifier Construction	238	33	191	103	15	71	29	23	
Wastewater Storage Excavation	255	39	236	97	27	370	67	57	
Wastewater Storage Construction	201	25	115	85	6	62	23	20	
Recycled Water Storage Excavation	249	37	223	95	23	367	65	56	
Recycled Water Storage Construction	201	25	115	85	6	75	28	26	
Filtration and Adv. Treatment	134	18	93	60	6	360	57	54	

Concurrent activities: filtration and adv. Treatment, secondary clarifier construction, aeration construction, & primary clarifier construction (Jan 2013 - Dec 2013)	838	116	646	366	47	571	143	123	
Concurrent activities: secondary clarifier excavation, aeration excavation, & primary clarifier excavation (July 2012)	944	126	586	308	54	1,121	196	176	
Concurrent activities: secondary clarifier construction, aeration construction, & primary clarifier construction (Aug - Dec 2012)	704	97	553	307	41	211	86	69	

<b>Maximum Daily Emissions for Storage (wastewater storage &amp; recycled water storage excavation)</b>	504	76	459	191	50	738	132	113	
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**NOTES:**

	w/o mitigation	with mitigation
Average Wind Speed (mph)	9.00	9.00
Moisture Content	2%	10%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34

/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1

/b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height

/c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2

PROJECT NAME: LAG 30 MGD

PROJECT #: 2004-076

ANNUAL EMISSIONS (tons per year)

Construction Phase	CO	ROG	NOX	NOx w/ mitigation	SOX	PM10 (w/o mitigation)	PM10 (w/ mitigation)	PM10 (w/ Rule 403 and mitigation)
<b>2008 through 2009</b>								
MF/RO	17	2	12	8	1	47	7	7
<i>Total</i>	17	2	12	8	1	47	7	7
<b>2012</b>								
Secondary Clarifier Excavation	2	0	1	1	0	2	0	0
Secondary Clarifier Construction	14	2	11	6	1	4	2	1
Aeration Basin Excavation	5	1	3	2	0	6	1	1
Aeration Basin Construction	12	2	9	5	1	3	1	1
Primary Clarifier Excavation	1	0	1	0	0	2	0	0
Primary Clarifier Construction	14	2	11	6	1	4	2	1
<i>Total</i>	49	7	37	20	3	22	7	6
<b>2013 through 2014</b>								
MF/RO	17	2	12	8	1	47	7	7
Secondary Clarifier Construction	31	4	25	13	2	9	4	3
Aeration Basin Construction	30	4	24	13	2	9	4	3
Primary Clarifier Construction	30	4	24	13	2	9	4	3
<i>Total</i>	109	15	84	48	6	74	19	16
<b>2017</b>								
Wastewater Storage Excavation	3	0	3	1	0	4	1	1
Wastewater Storage Construction	24	3	14	10	1	7	3	2
Recycled Water Storage Excavation	3	0	3	1	0	4	1	1
Recycled Water Storage Construction	24	3	14	10	1	9	3	3
<i>Total</i>	53	7	33	22	2	25	8	7
<b>2018 through 2019</b>								
Wastewater Storage Construction	26	3	15	11	1	8	3	3
Recycled Water Storage Construction	26	3	15	11	1	10	4	3
<i>Total</i>	52	7	30	22	1	18	7	6

**PROJECT NAME:**  
**PROJECT #:**

NEIS II - 1  
2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0192710	0.0023791	0.0266381	0.0000376	0.0005180
Light Duty Cars (worker vehicles)	0.1209629	0.0134057	0.0115321	0.0001023	0.0009462
<b>Assumptions:</b>					
Construction Year	2009				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.047	0.074	0.919	0.243	0.049
Backhoe	0.419	0.119	0.777	0.115	0.082
Loader	0.419	0.119	0.777	0.115	0.082
Tunnel Boring Machine	0.507	0.108	1.289	0.223	0.061
Small Crane	0.507	0.108	1.289	0.223	0.061
Crane	0.347	0.073	0.864	0.196	0.045
Concrete Mixer	0.045	0.010	0.068	-	0.005
Compressor/Generator	0.307	0.086	0.614	0.001	0.046
Fork Lift	0.249	0.069	0.406	-	0.045
Locomotive	0.507	0.108	1.289	0.223	0.061
Slurry Tank	0.507	0.108	1.289	0.223	0.061
Vent Fan	0.451	0.117	0.747	0.128	0.070
Elevator	0.451	0.117	0.747	0.128	0.070
Grout Plant	0.507	0.108	1.289	0.223	0.061
Machine Shop	0.451	0.117	0.747	0.128	0.070
Power Tools	0.451	0.117	0.747	0.128	0.070
Roller	0.356	0.060	0.593	0.139	0.042
Grader	0.546	0.124	1.442	0.276	0.074
Paver	0.435	0.098	0.802	0.165	0.058
Other equipment	0.534	0.115	1.336	0.223	0.063
Drill Rig	0.472	0.056	1.099	0.329	0.043

Source: South Coast Air Quality Management District (SCAQMD)

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>

Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook \*\*Note: Weighted average based on travel characteristics

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor (2.1)(G/12)(H/30)((J/3) <sup>0.7</sup> ((I/4) <sup>0.5</sup> ((365-K)/365)	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

PROJECT NAME:  
PROJECT #:

NEIS II - 1  
2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Shaft Construction</b>							
Crane	1	22	7.634	1.606	19.008	4.312	0.99
Excavator	1	22	1.023	1.628	20.218	5.346	1.078
Loader	2	22	18.436	5.236	34.188	5.06	3.608
Slurry Tank	1	22	11.154	2.376	28.358	4.906	1.342
Compressor/Generator	1	22	6.754	1.892	13.508	0.022	1.012
Power Tools	2	22	19.844	5.148	32.868	5.632	3.08
<b>Total</b>	<b>8</b>		<b>64.85</b>	<b>17.89</b>	<b>148.15</b>	<b>25.28</b>	<b>11.11</b>
<b>Primary Tunnel</b>							
Tunnel Boring Machine	1	22	11.15	2.38	28.36	4.91	1.34
Crane	2	13	9.02	1.90	22.46	5.10	1.17
Loader	2	13	10.89	3.09	20.20	2.99	2.13
Fork Lift	1	13	3.24	0.90	5.28	0.00	0.59
Locomotive	3	13	19.77	4.21	50.27	8.70	2.38
Vent Fan	1	13	5.86	1.52	9.71	1.66	0.91
Elevator	1	13	5.86	1.52	9.71	1.66	0.91
Grout Plant	1	13	6.59	1.40	16.76	2.90	0.79
Machine Shop	1	13	5.86	1.52	9.71	1.66	0.91
Power Tools	2	13	11.726	3.042	19.422	3.328	1.82
<b>Total</b>	<b>13</b>		<b>89.99</b>	<b>21.49</b>	<b>191.89</b>	<b>32.91</b>	<b>12.95</b>
<b>Tunnel Lining</b>							
Crane	2	13	9.02	1.90	22.46	5.10	1.17
Loader	1	13	5.45	1.55	10.10	1.50	1.07
Fork Lift	1	13	3.24	0.90	5.28	0.00	0.59
Locomotive	2	13	13.18	2.81	33.51	5.80	1.59
Vent Fan	1	13	5.86	1.52	9.71	1.66	0.91
Elevator	1	13	5.86	1.52	9.71	1.66	0.91
Grout Plant	1	13	6.59	1.40	16.76	2.90	0.79
Machine Shop	1	13	5.86	1.52	9.71	1.66	0.91
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>10</b>		<b>66.79</b>	<b>16.16</b>	<b>136.67</b>	<b>23.61</b>	<b>9.75</b>
<b>Diversions</b>							
Small Crane	2	13	13.18	2.81	33.51	5.80	1.59
Excavator	4	13	2.42	3.85	47.79	12.64	2.55
Backhoe	1	13	5.45	1.55	10.10	1.50	1.07
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>9</b>		<b>32.77</b>	<b>11.25</b>	<b>110.83</b>	<b>23.26</b>	<b>7.02</b>
<b>Maintenance Hole and Drop Structures</b>							
Crane	1	13	4.51	0.95	11.23	2.55	0.59
Small Crane	1	13	6.59	1.40	16.76	2.90	0.79
Loader	2	13	10.89	3.09	20.20	2.99	2.13
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>6</b>		<b>33.72</b>	<b>8.49</b>	<b>67.61</b>	<b>11.77</b>	<b>5.33</b>
<b>Maintenance Chambers</b>							
Concrete Mixer	1	13	0.59	0.13	0.88	0.00	0.07
Compressor/Generator	2	13	7.98	2.24	15.96	0.03	1.20
Drill Rig	1	13	6.14	0.73	14.29	4.28	0.56
Other equipment	1	13	6.94	1.50	17.37	2.90	0.82
<b>Total</b>	<b>5</b>		<b>21.65</b>	<b>4.59</b>	<b>48.50</b>	<b>7.20</b>	<b>2.64</b>
<b>Paving</b>							
Roller	1	13	4.63	0.78	7.71	1.81	0.55
Grader	1	13	7.10	1.61	18.75	3.59	0.96
Paver	1	13	5.66	1.27	10.43	2.15	0.75
<b>Total</b>	<b>3</b>		<b>17.38</b>	<b>3.67</b>	<b>36.88</b>	<b>7.54</b>	<b>2.26</b>
equipment emissions = # equipment * hours of use * emissions factor							

**PROJECT NAME:** NEIS II - 1  
**PROJECT #:** 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)							
	CO	ROG	NOX	NOx w/ Mit	SOX	PM10 (w/o mit)	PM10 w/mit	
Shaft Construction	64.85	17.89	148.15	20.74	25.28	11.11	1.40	
Primary Tunnel	89.99	21.49	191.89	26.86	32.91	12.95	1.63	
Tunnel Lining	66.79	16.16	136.67	19.13	23.61	9.75	1.23	
Diversions	32.77	11.25	110.83	15.52	23.26	7.02	0.88	
Maintenance hole and Drop Structure	33.72	8.49	67.61	9.47	11.77	5.33	0.67	
Paving	17.38	3.67	36.88	5.16	7.54	2.26	0.29	
Maintenance chamber	21.65	4.59	48.50	6.79	7.20	2.64	0.33	

equipment emissions = # equipment \* hours of use \* emissions factor  
 Mitigation Measure 1: Use of emulsified diesel fuel on construction equipment (reduces NOx and PM10 emissions)  
 Mitigation Measure 2: Use of diesel particulate filter on construction equipment (reduces PM10 emissions)

**WORKER VEHICLES (off site)**

Construction Phase	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Shaft Construction (1)	20.0	40	1,600	193.54	21.45	18.45	0.164	1.51
Primary Tunnel (2)	20.0	75	3,000	362.89	40.22	34.60	0.307	2.84
Tunnel Lining	20.0	25	1,000	120.96	13.41	11.53	0.102	0.95
Diversions	20.0	15	600	72.58	8.04	6.92	0.061	0.57
Maintenance hole and Drop Structures	20.0	10	400	48.39	5.36	4.61	0.041	0.38
Paving	20.0	10	400	48.39	5.36	4.61	0.041	0.38
Maintenance chamber	20.0	10	400	48.39	5.36	4.61	0.041	0.38

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor  
 (1) Each shift would include 20 workers, and there would be 2 shifts per day.  
 (2) There would be 25 workers per shift with 3 shifts per 24 hour rotation.

**HAUL TRUCKS (off site)**

Construction Phase	# of Haul Loads per Day	Haul Truck Trip Length (one way)	Haul Truck VMT/day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Shaft Construction	11	20	440	8.48	1.05	11.72	0.02	0.23
Primary Tunnel	48	20	1,920	37.00	4.57	51.15	0.07	0.99
Primary Tunnel - Supply Trips	36	65	4,680	90.19	11.13	124.67	0.18	2.42
Tunnel Lining - Supply Trips	17	40	1,360	26.21	3.24	36.23	0.05	0.70
Tunnel Lining - Other Supply Trips	51	20	2,040	39.31	4.85	54.34	0.08	1.06
Diversions (3)	2	20	80	1.54	0.19	2.13	0.00	0.04
Maintenance hole and Drop structure (4)	4	20	160	3.08	0.38	4.26	0.01	0.08
Paving	10	20	400	7.71	0.95	10.66	0.02	0.21
Maintenance chamber	1	30	60	1.16	0.14	1.60	0.00	0.03

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor  
 (3) Assumes 2 truck trips per main. hole and that 2 maintenance holes would be under construction at one time per heading. There are 2 headings.  
 (4) Assumes 4 truck trips per main. hole and that 2 maintenance holes would be under construction at one time per heading. There are 2 headings.

PROJECT NAME: NEIS II - 1  
 PROJECT #: 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5)^1.3, G=Wind Speed (mph)	(H/2)^1.4, H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2)^1.4, H=Moisture Content	PM10 Emissions (w/ Rule 403)
Shaft Construction	26,389.0	120	219.9	275	549,771	2.15	16.79	0.04	16.79	0.04
Primary Tunnel (5)	379,288.8	396	957.8	1,197	2,394,500	2.15	16.79	0.17	16.79	0.17
Tunnel Lining	-	132	-	-	-	2.15	16.79	-	16.79	-
Diversions	467.0	10	46.7	58	116,750	2.15	16.79	0.01	16.79	0.01
Maintenance hole and Drop Structure (6)	1,239.0	14	88.5	111	221,250	2.15	16.79	0.02	16.79	0.02
Paving	-	5	-	-	-	-	-	-	-	-
Maintenance chamber	-	15	-	-	-	-	-	-	-	-

SCAQMD CEQA Handbook Table 9-9-G:  $PM_{10} \text{ emissions} = 0.001120 * (G / 5)^{1.3} / (H / 2)^{1.4} * (I / 2000)$   
 (5) 957.8 cy per day \* 2 headings \* 396

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/ Rule 403)
Shaft Construction	0.10	2.20	18.32	45%	40%	6.05
Primary Tunnel	0.10	9.60	79.94	45%	40%	26.38
Tunnel Lining	0.10	10.20	84.94	45%	40%	28.03
Diversions	0.10	0.40	3.33	45%	40%	1.10
Maintenance Hole and Drop	0.10	0.80	6.66	45%	40%	2.20
Paving	0.10	2.00	16.65	45%	40%	5.50
Maintenance chamber	0.10	0.20	1.67	45%	40%	0.55

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads  
 SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigation measure 1) \* (1 - percent efficiency of mitigation measure 2)  
**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)  
**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

**Asphalt Off-Gassing**

Construction Phase	Acres of Site to be Paved	Construction Days	ROG
Shaft Construction	-	120	-
Primary Tunnel	-	396	-
Tunnel Lining	-	132	-
Diversions	-	10	-
Maintenance hole and Drop	-	14	-
Paving	0.3	5	0.13
Maintenance chamber	-	-	-

ROG emissions from asphalt off-gassing = area \* VOC emissions factor / # of days paving  
 VOC emissions factor = 2.62 lb/acres

PROJECT NAME: NEIS II - 1  
 PROJECT #: 2004-076

TOTAL EMISSIONS										
Construction Phase	CO	ROG	NOX	NOx w/mitigation	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/Rule 403 and mitigation)		
Shaft Construction	267	40	178	51	25	31	19	9		
Primary Tunnel	580	77	402	237	33	99	43	32		
Tunnel Lining	253	38	239	121	24	97	41	33		
Diversions	107	19	120	25	23	11	9	3		
Maintenance hole and Drop	85	14	76	18	12	12	9	4		
Paving	69	10	52	20	8	20	8	6		
Maintenance chamber	78	10	55	14	7	5	3	1		
<i>Max Emission/a/</i>	<i>2,137</i>	<i>311</i>	<i>1,640</i>	<i>675</i>	<i>201</i>	<i>311</i>	<i>167</i>	<i>99</i>		

/a/ Assumes the following concurrent activities: construction of 1 shaft site, 2 tunneling operations, 2 diversion structures, 4 maintenance holes/drop structures, and 2 maintenance chambers.

**NOTES:**

	w/o mitigation	with mitigation
Average Wind Speed (mph)	9.00	9.00
Moisture Content	15%	15%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34

/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1  
 /b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height  
 /c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2

PROJECT NAME: NEIS II - 1

PROJECT #: 2004-076

**ANNUAL EMISSIONS (tons per year)**

Construction Phase	CO	ROG	NOX	NOx w/mitigation	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/Rule 403 and mitigation)
<b>2010 through 2011</b>								
Shaft Construction	16	2	11	3	2	2	1	1
Primary Tunnel	212	28	147	87	12	36	16	12
Diversions	1	0	1	0	0	0	0	0
Maintenance hole and Drop	2	0	2	1	0	0	0	0
Maintenance chamber	1	0	1	0	0	0	0	0
<i>Total</i>	<i>232</i>	<i>31</i>	<i>162</i>	<i>91</i>	<i>14</i>	<i>39</i>	<i>17</i>	<i>12</i>

**PROJECT NAME:**  
**PROJECT #:**

NEIS II - 2  
2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0192710	0.0023791	0.0266381	0.0000376	0.0005180
Light Duty Cars (worker vehicles)	0.1209629	0.0134057	0.0115321	0.0001023	0.0009462
<b>Assumptions:</b>					
Construction Year	2009				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.047	0.074	0.919	0.243	0.049
Backhoe	0.419	0.119	0.777	0.115	0.082
Loader	0.419	0.119	0.777	0.115	0.082
Tunnel Boring Machine	0.507	0.108	1.289	0.223	0.061
Small Crane	0.507	0.108	1.289	0.223	0.061
Crane	0.347	0.073	0.864	0.196	0.045
Concrete Mixer	0.045	0.010	0.068	-	0.005
Compressor/Generator	0.307	0.086	0.614	0.001	0.046
Fork Lift	0.249	0.069	0.406	-	0.045
Locomotive	0.507	0.108	1.289	0.223	0.061
Slurry Tank	0.507	0.108	1.289	0.223	0.061
Vent Fan	0.451	0.117	0.747	0.128	0.070
Elevator	0.451	0.117	0.747	0.128	0.070
Grout Plant	0.507	0.108	1.289	0.223	0.061
Machine Shop	0.451	0.117	0.747	0.128	0.070
Power Tools	0.451	0.117	0.747	0.128	0.070
Roller	0.356	0.060	0.593	0.139	0.042
Grader	0.546	0.124	1.442	0.276	0.074
Paver	0.435	0.098	0.802	0.165	0.058
Other equipment	0.534	0.115	1.336	0.223	0.063
Drill Rig	0.472	0.056	1.099	0.329	0.043

Source: South Coast Air Quality Management District (SCAQMD)

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>

Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook \*\*Note: Weighted average based on travel characteristics

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor (2.1)(G/12)(H/30)((J/3) <sup>0.7</sup> ((I/4) <sup>0.5</sup> ((365-K)/365)	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

PROJECT NAME:  
PROJECT #:

NEIS II - 2  
2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Shaft Construction</b>							
Crane	1	22	7.634	1.606	19.008	4.312	0.99
Excavator	1	22	1.023	1.628	20.218	5.346	1.078
Loader	2	22	18.436	5.236	34.188	5.06	3.608
Slurry Tank	1	22	11.154	2.376	28.358	4.906	1.342
Compressor/Generator	1	22	6.754	1.892	13.508	0.022	1.012
Power Tools	2	22	19.844	5.148	32.868	5.632	3.08
<b>Total</b>	<b>8</b>		<b>64.85</b>	<b>17.89</b>	<b>148.15</b>	<b>25.28</b>	<b>11.11</b>
<b>Primary Tunnel</b>							
Tunnel Boring Machine	1	22	11.15	2.38	28.36	4.91	1.34
Crane	2	13	9.02	1.90	22.46	5.10	1.17
Loader	2	13	10.89	3.09	20.20	2.99	2.13
Fork Lift	1	13	3.24	0.90	5.28	0.00	0.59
Locomotive	3	13	19.77	4.21	50.27	8.70	2.38
Vent Fan	1	13	5.86	1.52	9.71	1.66	0.91
Elevator	1	13	5.86	1.52	9.71	1.66	0.91
Grout Plant	1	13	6.59	1.40	16.76	2.90	0.79
Machine Shop	1	13	5.86	1.52	9.71	1.66	0.91
Power Tools	2	13	11.726	3.042	19.422	3.328	1.82
<b>Total</b>	<b>13</b>		<b>89.99</b>	<b>21.49</b>	<b>191.89</b>	<b>32.91</b>	<b>12.95</b>
<b>Tunnel Lining</b>							
Crane	2	13	9.02	1.90	22.46	5.10	1.17
Loader	1	13	5.45	1.55	10.10	1.50	1.07
Fork Lift	1	13	3.24	0.90	5.28	0.00	0.59
Locomotive	2	13	13.18	2.81	33.51	5.80	1.59
Vent Fan	1	13	5.86	1.52	9.71	1.66	0.91
Elevator	1	13	5.86	1.52	9.71	1.66	0.91
Grout Plant	1	13	6.59	1.40	16.76	2.90	0.79
Machine Shop	1	13	5.86	1.52	9.71	1.66	0.91
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>10</b>		<b>66.79</b>	<b>16.16</b>	<b>136.67</b>	<b>23.61</b>	<b>9.75</b>
<b>Diversions</b>							
Small Crane	2	13	13.18	2.81	33.51	5.80	1.59
Excavator	4	13	2.42	3.85	47.79	12.64	2.55
Backhoe	1	13	5.45	1.55	10.10	1.50	1.07
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>9</b>		<b>32.77</b>	<b>11.25</b>	<b>110.83</b>	<b>23.26</b>	<b>7.02</b>
<b>Maintenance Hole and Drop Structures</b>							
Crane	1	13	4.51	0.95	11.23	2.55	0.59
Small Crane	1	13	6.59	1.40	16.76	2.90	0.79
Loader	2	13	10.89	3.09	20.20	2.99	2.13
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>6</b>		<b>33.72</b>	<b>8.49</b>	<b>67.61</b>	<b>11.77</b>	<b>5.33</b>
<b>Maintenance Chambers</b>							
Concrete Mixer	1	13	0.59	0.13	0.88	0.00	0.07
Compressor/Generator	2	13	7.98	2.24	15.96	0.03	1.20
Drill Rig	1	13	6.14	0.73	14.29	4.28	0.56
Other equipment	1	13	6.94	1.50	17.37	2.90	0.82
<b>Total</b>	<b>5</b>		<b>21.65</b>	<b>4.59</b>	<b>48.50</b>	<b>7.20</b>	<b>2.64</b>
<b>Paving</b>							
Roller	1	13	4.63	0.78	7.71	1.81	0.55
Grader	1	13	7.10	1.61	18.75	3.59	0.96
Paver	1	13	5.66	1.27	10.43	2.15	0.75
<b>Total</b>	<b>3</b>		<b>17.38</b>	<b>3.67</b>	<b>36.88</b>	<b>7.54</b>	<b>2.26</b>
equipment emissions = # equipment * hours of use * emissions factor							

PROJECT NAME: NEIS II - 2  
 PROJECT #: 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)							
	CO	ROG	NOX	NOX w/mit	SOX	PM10	PM10 w/mit	
Shaft Construction	64.85	17.89	148.15	20.74	25.28	11.11	1.40	
Primary Tunnel	89.99	21.49	191.89	26.86	32.91	12.95	1.63	
Tunnel Lining	66.79	16.16	136.67	19.13	23.61	9.75	1.23	
Diversions	32.77	11.25	110.83	15.52	23.26	7.02	0.88	
Maintenance hole and Drop Structure	33.72	8.49	67.61	9.47	11.77	5.33	0.67	
Paving	17.38	3.67	36.88	5.16	7.54	2.26	0.29	
Maintenance chamber	21.65	4.59	48.50	6.79	7.20	2.64	0.33	

equipment emissions = # equipment \* hours of use \* emissions factor  
 Mitigation Measure 1: Use of emulsified diesel fuel on construction equipment (reduces NOx and PM10 emissions)  
 Mitigation Measure 2: Use of diesel particulate filter on construction equipment (reduces PM10 emissions)

**WORKER VEHICLES (off site)**

Construction Phase	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Shaft Construction (1)	20.0	40	1,600	193.54	21.45	18.45	0.164	1.51
Primary Tunnel (2)	20.0	75	3,000	362.89	40.22	34.60	0.307	2.84
Tunnel Lining	20.0	25	1,000	120.96	13.41	11.53	0.102	0.95
Diversions	20.0	15	600	72.58	8.04	6.92	0.061	0.57
Maintenance hole and Drop Structures	20.0	10	400	48.39	5.36	4.61	0.041	0.38
Paving	20.0	10	400	48.39	5.36	4.61	0.041	0.38
Maintenance chamber	20.0	10	400	48.39	5.36	4.61	0.041	0.38

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor  
 (1) Each shift would include 20 workers, and there would be 2 shifts per day.  
 (2) There would be 25 workers per shift with 3 shifts per 24 hour rotation.

**HAUL TRUCKS (off site)**

Construction Phase	# of Haul Loads per Day	Haul Truck Trip Length (one way)	Haul Truck VMT/day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Shaft Construction	15	20	600	11.56	1.43	15.98	0.02	0.31
Primary Tunnel	33	20	1,320	25.44	3.14	35.16	0.05	0.68
Primary Tunnel - Supply Trips	27	65	3,510	67.64	8.35	93.50	0.13	1.82
Tunnel Lining - Supply Trips	17	40	1,360	26.21	3.24	36.23	0.05	0.70
Tunnel Lining - Other Supply Trips	51	20	2,040	39.31	4.85	54.34	0.08	1.06
Diversions	2	20	80	1.54	0.19	2.13	0.00	0.04
Maintenance hole and Drop structure	6	20	240	4.63	0.57	6.39	0.01	0.12
Paving	10	20	400	7.71	0.95	10.66	0.02	0.21
Maintenance chamber	1	30	60	1.16	0.14	1.60	0.00	0.03

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor

PROJECT NAME: NEIS II - 2  
 PROJECT #: 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5) <sup>1.3</sup> , G=Wind Speed (mph)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/Rule 403)
Shaft Construction	24,505.0	120	204.2	255	510,521	2.15	16.79	0.04	16.79	0.04
Primary Tunnel (5)	264,171.6	396	667.1	834	1,667,750	2.15	16.79	0.12	16.79	0.12
Tunnel Lining	-	132	-	-	-	2.15	16.79	-	16.79	-
Diversions	433.0	10	43.3	54	108,250	2.15	16.79	0.01	16.79	0.01
Maintenance hole and Drop Structure (6)	1,610.0	14	115.0	144	287,500	2.15	16.79	0.02	16.79	0.02
Paving	-	5	-	-	-	-	-	-	-	-
Maintenance chamber	-	15	-	-	-	-	-	-	-	-

SCAQMD CEQA Handbook Table 9-9-G:  $PM10 \text{ emissions} = 0.001120 * (G / 5) ^ 1.3 / (H / 2) ^ 1.4 * (I / 2000)$

(5) 667.1 cy per day\* 396 days

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/Rule 403)
Shaft Construction	0.10	3.00	24.98	45%	40%	8.24
Primary Tunnel	0.10	6.60	54.96	45%	40%	18.14
Tunnel Lining	0.10	10.20	84.94	45%	40%	28.03
Diversions	0.10	0.40	3.33	45%	40%	1.10
Maintenance Hole and Drop	0.10	1.20	9.99	45%	40%	3.30
Paving	0.10	2.00	16.65	45%	40%	5.50
Maintenance chamber	0.10	0.20	1.67	45%	40%	0.55

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads

SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigation measure 1) \* (1 - percent efficiency of mitigation measure 2)

**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)

**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

**Asphalt Off-Gassing**

Construction Phase	Acres of Site to be Paved	Construction Days	ROG
Shaft Construction	-	120	-
Primary Tunnel	-	396	-
Tunnel Lining	-	132	-
Diversions	-	10	-
Maintenance hole and Drop	-	14	-
Paving	0.3	5	0.13
Maintenance chamber	-	-	-

ROG emissions from asphalt off-gassing = area \* VOC emissions factor / # of days paving

VOC emissions factor = 2.62 lb/acres

PROJECT NAME: NEIS II - 2  
 PROJECT #: 2004-076

TOTAL EMISSIONS									
Construction Phase	CO	ROG	NOX	NOX (w/mit)	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/Rule 403 and Mit)	
Shaft Construction	270	41	183	55	25	38	21	11.51	
Primary Tunnel	546	73	355	97	33	73	37	23.41	
Tunnel Lining	253	38	239	124	24	97	40	32.02	
Diversions	107	19	120	59	23	11	9	3.26	
Maintenance hole and Drop	87	14	79	68	12	16	9	5.42	
Paving	70	10	52	12	8	19	8	6.20	
Maintenance chamber	78	10	55	18	7	5	4	1.38	
Max Emission/a/	2,078	304	1,557	675	201	279	156	89	
/a/ Assumes the following concurrent activities: construction of 1 shaft site, 2 tunneling operations, 2 diversion structures, 4 maintenance holes/drop structures, and 2 maintenance chambers.									

**NOTES:**

	w/o mitigation	with mitigation
Average Wind Speed (mph)	9.00	9.00
Moisture Content	15%	15%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34

/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1

/b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height

/c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2

**PROJECT NAME:**  
**PROJECT #:**

GBIS II - 1 & 2  
2004-076

EMFAC2002 RATES (pounds per mile)					
Vehicle Type	CO	ROG	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Heavy Duty Trucks	0.0192710	0.0023791	0.0266381	0.0000376	0.0005180
Light Duty Cars (worker vehicles)	0.1209629	0.0134057	0.0115321	0.0001023	0.0009462
<b>Assumptions:</b>					
Construction Year	2009				
Season	Winter				

EQUIPMENT EMISSION FACTORS (pounds per hour)					
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Excavator	0.047	0.074	0.919	0.243	0.049
Backhoe	0.419	0.119	0.777	0.115	0.082
Loader	0.419	0.119	0.777	0.115	0.082
Tunnel Boring Machine	0.507	0.108	1.289	0.223	0.061
Small Crane	0.507	0.108	1.289	0.223	0.061
Crane	0.347	0.073	0.864	0.196	0.045
Concrete Mixer	0.045	0.010	0.068	-	0.005
Compressor/Generator	0.307	0.086	0.614	0.001	0.046
Fork Lift	0.249	0.069	0.406	-	0.045
Locomotive	0.507	0.108	1.289	0.223	0.061
Slurry Tank	0.507	0.108	1.289	0.223	0.061
Vent Fan	0.451	0.117	0.747	0.128	0.070
Elevator	0.451	0.117	0.747	0.128	0.070
Grout Plant	0.507	0.108	1.289	0.223	0.061
Machine Shop	0.451	0.117	0.747	0.128	0.070
Power Tools	0.451	0.117	0.747	0.128	0.070
Roller	0.356	0.060	0.593	0.139	0.042
Grader	0.546	0.124	1.442	0.276	0.074
Paver	0.435	0.098	0.802	0.165	0.058
Other equipment	0.534	0.115	1.336	0.223	0.063
Drill Rig	0.472	0.056	1.099	0.329	0.043

Source: South Coast Air Quality Management District (SCAQMD)

PAVED ROAD PM10 EMISSIONS (per VMT)		
Road Type	PM <sub>10</sub> / VMT	
	Vehicle	Haul Truck
Local Street	0.018000	0.213958299
Major Street/Highway	0.006400	0.149095835
Freeway	0.000650	0.062170612
<b>Composite Factor**</b>	<b>0.004110</b>	<b>0.073338596</b>

Source: Tables A9-9-B-1 and A9-9-C, SCAQMD CEQA Handbook \*\*Note: Weighted average based on travel characteristics

HAUL TRUCK ON UNPAVED SURFACE EMISSIONS	
FORMULA: E = V x F	
WHERE: E = Emissions V = Vehicle Miles of Travel F = Emissions Factor (2.1)(G/12)(H/30)((J/3) <sup>0.7</sup> ((I/4) <sup>0.5</sup> ((365-K)/365)	
VARIABLES G = Surface silt loading in percent H = Mean vehicle speed in miles per hour I = Mean number of wheels on vehicles J = Mean vehicle weight in tons K = Mean number of days per year with at least 0.01 inches of precipitation	
EMISSIONS FACTOR =	8.33 pounds per vehicle miles traveled
Source: Table A9-9-D, SCAQMD CEQA Handbook	

**PROJECT NAME:**  
**PROJECT #:**

GBIS II - 1 & 2  
2004-076

Equipment Type	Number	Hours in Workday	Emissions (ppd)				
			CO	ROG	NOX	SOX	PM10
<b>Shaft Construction</b>							
Crane	1	22	7.634	1.606	19.008	4.312	0.99
Excavator	1	22	1.023	1.628	20.218	5.346	1.078
Loader	2	22	18.436	5.236	34.188	5.06	3.608
Slurry Tank	1	22	11.154	2.376	28.358	4.906	1.342
Compressor/Generator	1	22	6.754	1.892	13.508	0.022	1.012
Power Tools	2	22	19.844	5.148	32.868	5.632	3.08
<b>Total</b>	<b>8</b>		<b>64.85</b>	<b>17.89</b>	<b>148.15</b>	<b>25.28</b>	<b>11.11</b>
<b>Primary Tunnel</b>							
Tunnel Boring Machine	1	22	11.15	2.38	28.36	4.91	1.34
Crane	2	13	9.02	1.90	22.46	5.10	1.17
Loader	2	13	10.89	3.09	20.20	2.99	2.13
Fork Lift	1	13	3.24	0.90	5.28	0.00	0.59
Locomotive	3	13	19.77	4.21	50.27	8.70	2.38
Vent Fan	1	13	5.86	1.52	9.71	1.66	0.91
Elevator	1	13	5.86	1.52	9.71	1.66	0.91
Grout Plant	1	13	6.59	1.40	16.76	2.90	0.79
Machine Shop	1	13	5.86	1.52	9.71	1.66	0.91
Power Tools	2	13	11.726	3.042	19.422	3.328	1.82
<b>Total</b>	<b>13</b>		<b>89.99</b>	<b>21.49</b>	<b>191.89</b>	<b>32.91</b>	<b>12.95</b>
<b>Tunnel Lining</b>							
Crane	2	13	9.02	1.90	22.46	5.10	1.17
Loader	1	13	5.45	1.55	10.10	1.50	1.07
Fork Lift	1	13	3.24	0.90	5.28	0.00	0.59
Locomotive	2	13	13.18	2.81	33.51	5.80	1.59
Vent Fan	1	13	5.86	1.52	9.71	1.66	0.91
Elevator	1	13	5.86	1.52	9.71	1.66	0.91
Grout Plant	1	13	6.59	1.40	16.76	2.90	0.79
Machine Shop	1	13	5.86	1.52	9.71	1.66	0.91
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>10</b>		<b>66.79</b>	<b>16.16</b>	<b>136.67</b>	<b>23.61</b>	<b>9.75</b>
<b>Diversions</b>							
Small Crane	2	13	13.18	2.81	33.51	5.80	1.59
Excavator	4	13	2.42	3.85	47.79	12.64	2.55
Backhoe	1	13	5.45	1.55	10.10	1.50	1.07
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>9</b>		<b>32.77</b>	<b>11.25</b>	<b>110.83</b>	<b>23.26</b>	<b>7.02</b>
<b>Maintenance Hole and Drop Structures</b>							
Crane	1	13	4.51	0.95	11.23	2.55	0.59
Small Crane	1	13	6.59	1.40	16.76	2.90	0.79
Loader	2	13	10.89	3.09	20.20	2.99	2.13
Power Tools	2	13	11.73	3.04	19.42	3.33	1.82
<b>Total</b>	<b>6</b>		<b>33.72</b>	<b>8.49</b>	<b>67.61</b>	<b>11.77</b>	<b>5.33</b>
<b>Maintenance Chambers</b>							
Concrete Mixer	1	13	0.59	0.13	0.88	0.00	0.07
Compressor/Generator	2	13	7.98	2.24	15.96	0.03	1.20
Drill Rig	1	13	6.14	0.73	14.29	4.28	0.56
Other equipment	1	13	6.94	1.50	17.37	2.90	0.82
<b>Total</b>	<b>5</b>		<b>21.65</b>	<b>4.59</b>	<b>48.50</b>	<b>7.20</b>	<b>2.64</b>
<b>Paving</b>							
Roller	1	13	4.63	0.78	7.71	1.81	0.55
Grader	1	13	7.10	1.61	18.75	3.59	0.96
Paver	1	13	5.66	1.27	10.43	2.15	0.75
<b>Total</b>	<b>3</b>		<b>17.38</b>	<b>3.67</b>	<b>36.88</b>	<b>7.54</b>	<b>2.26</b>
equipment emissions = # equipment * hours of use * emissions factor							

**PROJECT NAME:** GBIS II - 1 & 2  
**PROJECT #:** 2004-076

**CONSTRUCTION EQUIPMENT (on site)**

Construction Phase	Emissions (ppd)							
	CO	ROG	NOX	NOx w/Mit	SOX	PM10	PM10 w/Mit	
Shaft Construction	64.85	17.89	148.15	20.74	25.28	11.11	1.40	
Primary Tunnel	89.99	21.49	191.89	26.86	32.91	12.95	1.63	
Tunnel Lining	66.79	16.16	136.67	19.13	23.61	9.75	1.23	
Diversions	32.77	11.25	110.83	15.52	23.26	7.02	0.88	
Maintenance hole and Drop Structure	33.72	8.49	67.61	9.47	11.77	5.33	0.67	
Paving	17.38	3.67	36.88	5.16	7.54	2.26	0.29	
Maintenance chamber	21.65	4.59	48.50	6.79	7.20	2.64	0.33	

equipment emissions = # equipment \* hours of use \* emissions factor  
 Mitigation Measure 1: Use of emulsified diesel fuel on construction equipment (reduces NOx and PM10 emissions)  
 Mitigation Measure 2: Use of diesel particulate filter on construction equipment (reduces PM10 emissions)

**WORKER VEHICLES (off site)**

Construction Phase	Trip Length (one-way)	# Worker Vehicles	Total VMT/Day	Emissions (ppd)				
				CO	ROG	NOX	SOX	PM10
Shaft Construction (1)	20.0	40	1,600	193.54	21.45	18.45	0.164	1.51
Primary Tunnel (2)	20.0	75	3,000	362.89	40.22	34.60	0.307	2.84
Tunnel Lining	20.0	25	1,000	120.96	13.41	11.53	0.102	0.95
Diversions	20.0	15	600	72.58	8.04	6.92	0.061	0.57
Maintenance hole and Drop Structures	20.0	10	400	48.39	5.36	4.61	0.041	0.38
Paving	20.0	10	400	48.39	5.36	4.61	0.041	0.38
Maintenance chamber	20.0	10	400	48.39	5.36	4.61	0.041	0.38

worker vehicle emissions = one-way trip length \* 2 \* # worker vehicles \* worker vehicle emissions factor  
 (1) Each shift would include 20 workers, and there would be 2 shifts per day.  
 (2) There would be 25 workers per shift with 3 shifts per 24 hour rotation.

**HAUL TRUCKS (off site)**

Construction Phase	Haul Truck Trip			Emissions (ppd)				
	# of Haul Loads per Day	Length (one way)	Haul Truck VMT/day	CO	ROG	NOX	SOX	PM10
Shaft Construction	10	20	400	7.71	0.95	10.66	0.02	0.21
Primary Tunnel	33	20	1,320	25.44	3.14	35.16	0.05	0.68
Primary Tunnel - Supply Trips	27	65	3,510	67.64	8.35	93.50	0.13	1.82
Tunnel Lining - Supply Trips	17	40	1,360	26.21	3.24	36.23	0.05	0.70
Tunnel Lining - Other Supply	16	20	640	12.33	1.52	17.05	0.02	0.33
Diversions	2	20	80	1.54	0.19	2.13	0.00	0.04
Maintenance hole and Drop structure	4	20	160	3.08	0.38	4.26	0.01	0.08
Paving	10	20	400	7.71	0.95	10.66	0.02	0.21
Maintenance chamber	1	30	60	1.16	0.14	1.60	0.00	0.03

haul truck emissions = one-way trip length \* 2 \* # haul trucks \* haul truck emissions factor

**PROJECT NAME:** GBIS II - 1 & 2  
**PROJECT #:** 2004-076

**Dirt Piling / Material Handling for Truck Piling and / or to Form Storage Pile (on site)**

Construction Phase	Total Dirt/Debris to be Handled (cy)	# of Construction Days	Dirt Handled (cy/day)	Tons of Dirt/Day	I = Pounds of Dirt/Day Handled	(G/5) <sup>1.3</sup> , G=Wind Speed (mph)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/o Rule 403)	(H/2) <sup>1.4</sup> , H=Moisture Content	PM10 Emissions (w/Rule 403)
Shaft Construction	16,336.0	120	136.1	170	340,333	2.15	16.79	0.02	16.79	0.02
Primary Tunnel (5)	264,171.6	396	667.1	834	1,667,750	2.15	16.79	0.12	16.79	0.12
Tunnel Lining	-	132	-	-	-	2.15	16.79	-	16.79	-
Diversions	433.0	10	43.3	54	108,250	2.15	16.79	0.01	16.79	0.01
Maintenance hole and Drop Structure (6)	1,150.0	10	115.0	144	287,500	2.15	16.79	0.02	16.79	0.02
Paving	-	5	-	-	-	2.15	16.79	-	16.79	-
Maintenance chamber	-	15	-	-	-	2.15	16.79	-	16.79	-

SCAQMD CEQA Handbook Table 9-9-G:  $PM10 \text{ emissions} = 0.001120 * (G / 5)^{1.3} / (H / 2)^{1.4} * (I / 2000)$   
(5) 667.1 cy per day \* 396 days

**Trucks on Unpaved Surfaces (on site and off site)**

Construction Phase	Length of Unpaved Site (miles)	VMT on Unpaved Site	PM10 Emissions (w/o Rule 403)	% Reduction Efficiency of Mitigation Measure 1	% Reduction Efficiency of Mitigation Measure 2	PM10 Emissions (w/Rule 403)
Shaft Construction	0.10	2.00	16.65	45%	40%	5.50
Primary Tunnel	0.10	6.60	54.96	45%	40%	18.14
Tunnel Lining	0.10	3.20	26.65	45%	40%	8.79
Diversions	0.10	0.40	3.33	45%	40%	1.10
Maintenance Hole and Drop	0.10	0.80	6.66	45%	40%	2.20
Paving	0.10	2.00	16.65	45%	40%	5.50
Maintenance chamber	0.10	0.20	1.67	45%	40%	0.55

SCAQMD CEQA Air Quality Handbook Table A9-9-D: unmitigated PM10 emissions = VMT \* emissions factor for vehicles on unpaved roads  
SCAQMD CEQA Handbook Table A11-9-A: mitigated PM10 emissions = unmitigated PM10 emissions \* (1 - percent efficiency of mitigation measure 1) \* (1 - percent efficiency of mitigation measure 2)  
**Mitigation Measure 1** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Apply water three times daily, or apply non-toxic soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces. (efficiency rate: 45% - 85%)  
**Mitigation Measure 2** - SCAQMD CEQA Air Quality Handbook Table A11-9-A; Traffic speeds on all unpaved roads shall be reduced to 15 mph or less. (efficiency rate: 40% - 70%)

**Asphalt Off-Gassing**

Construction Phase	Acres of Site to be Paved	Construction Days	ROG
Shaft Construction	-	120	-
Primary Tunnel	-	396	-
Tunnel Lining	-	132	-
Diversions	-	10	-
Maintenance hole and Drop	-	10	-
Paving	0.3	5	0.13
Maintenance chamber	-	-	-

ROG emissions from asphalt off-gassing = area \* VOC emissions factor / # of days paving  
VOC emissions factor = 2.62 lb/acres

**PROJECT NAME:** GBIS II - 1 & 2  
**PROJECT #:** 2004-076

TOTAL EMISSIONS										
Construction Phase	CO	ROG	NOX	NOx w/Mit	SOX	PM10 (w/o 403)	PM10 (w/ 403)	PM10 w/ 403 and Mit		
Shaft Construction	266	40	177	50	25	30	18	9		
Primary Tunnel	546	73	355	190	33	73	37	25		
Tunnel Lining	226	34	201	84	24	38	21	12		
Diversions	107	19	120	25	23	11	9	3		
Maintenance hole and Drop	85	14	76	18	12	12	8	3		
Paving	69	10	52	20	8	19	8	6		
Maintenance chamber	78	10	55	13	7	5	4	1		
<i>Max Emission/a/</i>	<i>2,891</i>	<i>424</i>	<i>2,171</i>	<i>830</i>	<i>281</i>	<i>367</i>	<i>209</i>	<i>115</i>		
<i>/a/ Assumes the following concurrent activities: construction of 1 shaft site, 3 tunneling operations, 3 diversion structures, 6 maintenance holes/drop structures, and 2 maintenance chambers.</i>										

**NOTES:**

	<i>w/o mitigation</i>	<i>with mitigation</i>
Average Wind Speed (mph)	9.00	9.00
Moisture Content	15%	15%
Dirt Weight (2,000 pounds/ton)	2,000	2,000
Silt Content /a/	15%	15%
Percent Wind Speed /b/	100	100
Precipitation Days /c/	34	34
<i>/a/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-1</i>		
<i>/b/ Percent of time unobstructed wind speed exceeds 12 mph or 5.4 meters/second at mean pile height</i>		
<i>/c/ SCAQMD CEQA Air Quality Handbook Table A9-9-E-2</i>		

PROJECT NAME: GBIS II - 1 & 2

PROJECT #: 2004-076

**ANNUAL EMISSIONS (tons per year)**

Construction Phase	CO	ROG	NOX	NOx w/mitigation	SOX	PM10 (w/o Rule 403)	PM10 (w/ Rule 403)	PM10 (w/Rule 403 and mitigation)
<b>2011 through 2014</b>								
Shaft Construction	16	2	11	3	2	2	1	1
Primary Tunnel	299	40	194	104	18	40	20	14
Diversions	2	0	2	0	0	0	0	0
Maintenance hole and Drop	3	0	2	1	0	0	0	0
Maintenance chamber	1	0	1	0	0	0	0	0
<i>Total</i>	320	43	210	108	21	43	22	14

**CONCURRENT CONSTRUCTION EMISSIONS (Daily Emissions - pounds per day)**

**Alternative 1**

	CO	ROG	NOx	NOx w/mit	SOx	PM10 w/o Rule 403	PM10 w/Rule 403	PM10 w/ Rule 403 & mit
<b>January - June 2010</b>								
Hyperion Full (Secondary Clarifier Module Construction, Clarifier Excavation, & Biosolids Handling Construction)	231	33	148	133	15	56	25	20
Tillman Process Upgrades (Storage Construction & MF/RO)	341	49	355	212	28	21	113	103
NEIS (Alignment 1)	2,137	311	1,640	675	201	311	167	99
<b>Total</b>	<b>2,709</b>	<b>393</b>	<b>2,143</b>	<b>1,020</b>	<b>244</b>	<b>388</b>	<b>305</b>	<b>222</b>
<b>July 2011 - December 2011</b>								
Hyperion Full (Secondary Clarifier Module Construction, Clarifier Excavation)	597	73	172	157	16	28	17	12
Tillman Process Upgrades (MF/RO)	134	18	93	60	6	58	57	54
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
GBIS (Alignment 1 or 2)	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>5,759</b>	<b>826</b>	<b>4,075</b>	<b>1,721</b>	<b>503</b>	<b>764</b>	<b>451</b>	<b>280</b>
<b>January 2017 - December 2019</b>								
Hyperion Full (Digesters)	84	12	59	54	6	23	10	8
LAG Storage	504	76	459	191	50	738	132	113
<b>Total</b>	<b>588</b>	<b>88</b>	<b>517</b>	<b>245</b>	<b>56</b>	<b>760</b>	<b>142</b>	<b>121</b>

**Alternative 2**

	CO	ROG	NOx	NOx w/mit	SOx	PM10 w/o Rule 403	PM10 w/Rule 403	PM10 w/ Rule 403 & mit
<b>July 2008 - December 2008</b>								
Hyperion Process Upgrades (Secondary Clarifier Excavation & Biosolids Handling Bldg Const)	155	19	76	67	12	10	7	4
Tillman 80 MGD (MF/RO) & Tillman Storage Const	475	68	448	271	34	867	171	157
LAG 30 MGD (MF/RO & UV)	134	18	93	60	6	360	57	54
<b>Total</b>	<b>764</b>	<b>105</b>	<b>617</b>	<b>398</b>	<b>51</b>	<b>1,237</b>	<b>235</b>	<b>216</b>
<b>January 2010 - June 2010</b>								
Hyperion Process Upgrades (Secondary Clarifier Excavation, Secondary Clarifier Const & Biosolids Handling Bldg Const)	231	33	148	133	15	56	25	20
Tillman 80 MGD (MF/RO) & Tillman Storage Const	475	68	448	271	34	867	171	157
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
<b>Total</b>	<b>2,843</b>	<b>412</b>	<b>2,236</b>	<b>1,080</b>	<b>249</b>	<b>1,234</b>	<b>362</b>	<b>276</b>
<b>January 2011 - December 2011</b>								
Hyperion Process Upgrades (Secondary Clarifier Const)	0	0	0	0	0	0	0	0
Tillman 80 MGD (MF/RO)	134	18	93	60	6	358	57	54
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>5,162</b>	<b>753</b>	<b>3,903</b>	<b>1,565</b>	<b>487</b>	<b>1,036</b>	<b>434</b>	<b>268</b>
<b>January 2012 - June 2012</b>								
Tillman 80 MGD (MF/RO, UV, & Secondary Clarifier Const)	483	63	261	149	19	395	75	67
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>5,511</b>	<b>798</b>	<b>4,071</b>	<b>1,654</b>	<b>501</b>	<b>1,072</b>	<b>451</b>	<b>281</b>
<b>January 2013 - December 2013</b>								
Tillman 80 MGD (MF/RO, UV, & Secondary Clarifiers)	483	63	261	149	19	395	75	67
LAG 30 MGD (MF/RO, UV, Secondary Clarifier construction, & Aeration Basin & Primary Clarifier construction)	838	116	646	366	47	571	143	123
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>4,212</b>	<b>602</b>	<b>3,078</b>	<b>1,345</b>	<b>347</b>	<b>1,333</b>	<b>428</b>	<b>305</b>

**CONCURRENT CONSTRUCTION EMISSIONS (Daily Emissions - pounds per day)**

**Alternative 3**

	CO	ROG	NOx	NOx w/mit	SOx	PM10 w/o Rule 403	PM10 w/Rule 403	PM10 w/ Rule 403 & mit
<b>January 2010 - June 2010</b>								
Hyperion Full (Secondary Clarifier Module Construction, Clarifier Excavation, & Biosolids Handling Construction)	231	33	148	133	15	56	25	20
Tillman 100 MGD (MF/RO & UV)	134	18	93	60	6	58	57	54
Tillman Storage	341	49	355	212	28	21	113	103
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
<b>Total</b>	<b>2,843</b>	<b>412</b>	<b>2,236</b>	<b>1,080</b>	<b>249</b>	<b>446</b>	<b>362</b>	<b>276</b>
<b>January 2011 - December 2011</b>								
Hyperion Full (Secondary Clarifier Module Construction)	0	0	0	0	0	0	0	0
Tillman 100 MGD (MF/RO & UV)	134	18	93	60	6	58	57	54
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
GBIS	2,891	424	2,171	830	281	367	209	115
<b>January 2012 - February 2012</b>								
Tillman 100 MGD (MF/RO & Secondary Clarifier Excavation)	394	56	290	145	27	132	118	107
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>5,422</b>	<b>791</b>	<b>4,100</b>	<b>1,651</b>	<b>508</b>	<b>810</b>	<b>494</b>	<b>321</b>
<b>March 2012 - June 2012</b>								
Tillman 100 MGD (MF/RO & Secondary Clarifier Construction)	483	63	261	149	19	96	75	67
NEIS II (Alignment 1)	2,137	311	1,640	675	201	311	167	99
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>5,511</b>	<b>798</b>	<b>4,071</b>	<b>1,654</b>	<b>501</b>	<b>773</b>	<b>451</b>	<b>280</b>
<b>July 2012 - December 2013</b>								
Tillman 100 MGD (MF/RO, UV, & Secondary Clarifier Construction)	483	63	261	149	19	379	75	67
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>3,374</b>	<b>487</b>	<b>2,432</b>	<b>979</b>	<b>300</b>	<b>745</b>	<b>285</b>	<b>182</b>
<b>July 2014</b>								
Hyperion Process Upgrades (Digester Demolition)	155	19	76	67	12	10	7	4
TWRP 100 MGD (MF/RO, Primary Clarifier Excavation, Aeration Excavation, & Secondary Clarifier Excavation)	905	129	661	314	65	846	239	213
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>3,952</b>	<b>572</b>	<b>2,907</b>	<b>1,211</b>	<b>358</b>	<b>1,223</b>	<b>455</b>	<b>332</b>
<b>October 2014 - December 2014</b>								
Hyperion Process Upgrades (Digesters Excavation)	84	84	84	84	84	84	84	84
TWRP 100 MGD (MF/RO Primary Clarifier Construction, Aeration Construction & Secondary Clarifier Construction)	1,181	152	598	327	46	453	111	92
GBIS	2,891	424	2,171	830	281	367	209	115
<b>Total</b>	<b>4,156</b>	<b>661</b>	<b>2,853</b>	<b>1,242</b>	<b>411</b>	<b>904</b>	<b>405</b>	<b>292</b>

**Alternative 4**

Same as Alternative 3

ANNUAL CONSTRUCTION EMISSIONS (tons per year)

Alternative 1

	CO	ROG	NOx	NOx w/mit	SOx	PM10 w/o Rule 403	PM10 w/Rule 403	PM10 w/ Rule 403 & mit
<b>2009</b>								
Hyperion 500-mgd Expansion	66	8	23	21	2	13	5	5
Tillman Process Upgrades	17	2	12	8	1	8	7	7
Tillman Storage	29	4	18	14	1	1	4	3
LAG Storage	17	2	12	8	1	47	7	7
NEIS II	116	16	81	45	7	19	9	6
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>246</b>	<b>32</b>	<b>146</b>	<b>97</b>	<b>11</b>	<b>87</b>	<b>33</b>	<b>28</b>
<b>2010</b>								
Hyperion 500-mgd Expansion	139	18	64	60	6	64	16	14
Tillman Process Upgrades	17	2	12	8	1	8	7	7
Tillman Storage	15	2	9	7	0	0	2	2
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	232	31	162	91	14	39	17	12
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>404</b>	<b>53</b>	<b>247</b>	<b>165</b>	<b>21</b>	<b>111</b>	<b>43</b>	<b>36</b>
<b>2011</b>								
Hyperion 500-mgd Expansion	51	7	24	22	3	26	6	5
Tillman Process Upgrades	17	2	12	8	1	8	7	7
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	232	31	162	91	14	39	17	12
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>621</b>	<b>84</b>	<b>408</b>	<b>229</b>	<b>38</b>	<b>115</b>	<b>52</b>	<b>39</b>
<b>2012</b>								
Hyperion 500-mgd Expansion	29	4	11	10	1	4	2	2
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	116	16	81	45	7	19	9	6
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>465</b>	<b>63</b>	<b>301</b>	<b>163</b>	<b>29</b>	<b>66</b>	<b>32</b>	<b>22</b>
<b>2013</b>								
Hyperion 500-mgd Expansion	15	2	5	5	1	2	1	1
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>335</b>	<b>45</b>	<b>215</b>	<b>113</b>	<b>21</b>	<b>45</b>	<b>22</b>	<b>15</b>
<b>2014</b>								
Hyperion 500-mgd Expansion	16	2	12	11	1	17	4	4
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>336</b>	<b>45</b>	<b>222</b>	<b>119</b>	<b>22</b>	<b>60</b>	<b>26</b>	<b>18</b>
<b>2015 &amp; 2016</b>								
Hyperion 500-mgd Expansion	35	5	26	24	2	28	8	7
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>35</b>	<b>5</b>	<b>26</b>	<b>24</b>	<b>2</b>	<b>28</b>	<b>8</b>	<b>7</b>
<b>2017</b>								
Hyperion 500-mgd Expansion	78	9	22	20	2	4	2	2
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	53	7	33	22	2	25	8	7
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>131</b>	<b>16</b>	<b>55</b>	<b>43</b>	<b>4</b>	<b>28</b>	<b>10</b>	<b>8</b>
<b>2018 &amp; 2019</b>								
Hyperion 500-mgd Expansion	78	9	22	20	2	4	2	2
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	52	7	30	22	1	18	7	6
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>130</b>	<b>16</b>	<b>52</b>	<b>42</b>	<b>4</b>	<b>21</b>	<b>9</b>	<b>8</b>
<b>2020</b>								
Hyperion 500-mgd Expansion	39	5	11	10	1	2	1	1
Tillman Process Upgrades	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>39</b>	<b>5</b>	<b>11</b>	<b>10</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>

ANNUAL CONSTRUCTION EMISSIONS (tons per year)

Alternative 2

	CO	ROG	NOx	NOx w/mit	SOx	PM10 w/o Rule 403	PM10 w/Rule 403	PM10 w/ Rule 403 & mit
<b>2009</b>								
Hyperion Process Upgrades	66	8	23	21	2	13	5	5
Tillman 80-mgd	17	2	12	8	1	8	7	7
Tillman Storage	29	4	18	14	1	1	4	3
LAG 30-mgd	17	2	12	8	1	47	7	7
NEIS	116	16	81	45	7	19	9	6
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>246</b>	<b>32</b>	<b>146</b>	<b>97</b>	<b>11</b>	<b>87</b>	<b>33</b>	<b>28</b>
<b>2010</b>								
Hyperion Process Upgrades	139	18	64	60	6	64	16	14
Tillman 80-mgd	17	2	12	8	1	8	7	7
Tillman Storage	15	2	9	7	0	0	2	2
LAG 30-mgd	-	-	-	-	-	-	-	-
NEIS	232	31	162	91	14	39	17	12
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>404</b>	<b>53</b>	<b>247</b>	<b>165</b>	<b>21</b>	<b>111</b>	<b>43</b>	<b>36</b>
<b>2011</b>								
Hyperion Process Upgrades	51	7	24	22	3	26	6	5
Tillman 80-mgd	17	2	12	8	1	8	7	7
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	-	-	-	-	-	-	-	-
NEIS	232	31	162	91	14	39	17	12
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>621</b>	<b>84</b>	<b>408</b>	<b>229</b>	<b>38</b>	<b>115</b>	<b>52</b>	<b>39</b>
<b>2012</b>								
Hyperion Process Upgrades	-	-	-	-	-	-	-	-
Tillman 80-mgd	38	5	24	14	2	23	10	9
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	49	7	37	20	3	22	7	6
NEIS	116	16	81	45	7	19	9	6
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>523</b>	<b>71</b>	<b>352</b>	<b>187</b>	<b>32</b>	<b>107</b>	<b>46</b>	<b>35</b>
<b>2013</b>								
Hyperion Process Upgrades	-	-	-	-	-	-	-	-
Tillman 80-mgd	63	8	34	19	2	49	10	9
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	109	15	84	48	6	74	19	16
NEIS	-	-	-	-	-	-	-	-
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>492</b>	<b>67</b>	<b>328</b>	<b>175</b>	<b>29</b>	<b>166</b>	<b>50</b>	<b>39</b>
<b>2014</b>								
Hyperion Process Upgrades	16	2	12	11	1	17	4	4
Tillman 80-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	109	15	84	48	6	74	19	16
NEIS	-	1	2	3	4	5	6	7
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>445</b>	<b>62</b>	<b>308</b>	<b>170</b>	<b>32</b>	<b>139</b>	<b>50</b>	<b>41</b>
<b>2015 &amp; 2016</b>								
Hyperion Process Upgrades	35	5	26	24	2	28	8	7
Tillman 80-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	-	-	-	-	-	-	-	-
NEIS	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>35</b>	<b>5</b>	<b>26</b>	<b>24</b>	<b>2</b>	<b>28</b>	<b>8</b>	<b>7</b>
<b>2017</b>								
Hyperion Process Upgrades	78	9	22	20	2	4	2	2
Tillman 80-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	53	7	33	22	2	25	8	7
NEIS	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>131</b>	<b>16</b>	<b>55</b>	<b>43</b>	<b>4</b>	<b>28</b>	<b>10</b>	<b>8</b>
<b>2018</b>								
Hyperion Process Upgrades	78	9	22	20	2	4	2	2
Tillman 80-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	52	7	30	22	1	18	7	6
NEIS	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>130</b>	<b>16</b>	<b>52</b>	<b>42</b>	<b>4</b>	<b>21</b>	<b>9</b>	<b>8</b>
<b>2019</b>								
Hyperion Process Upgrades	78	9	22	20	2	4	2	2
Tillman 80-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	26	3	15	11	1	9	3	3
NEIS	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>104</b>	<b>13</b>	<b>37</b>	<b>31</b>	<b>3</b>	<b>13</b>	<b>5</b>	<b>5</b>
<b>2020</b>								
Hyperion Process Upgrades	39	5	11	10	1	2	1	1
Tillman 80-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG 30-mgd	-	-	-	-	-	-	-	-
NEIS	-	-	-	-	-	-	-	-

ANNUAL CONSTRUCTION EMISSIONS (tons per year)

GBIS	-	-	-	-	-	-	-	-
Total	39	5	11	10	1	2	1	1

ANNUAL CONSTRUCTION EMISSIONS (tons per year)

Alternative 3 & 4

	CO	ROG	NOx	NOx w/mit	SOx	PM10 w/o Rule 403	PM10 w/Rule 403	PM10 w/ Rule 403 & mit
<b>2009</b>								
Hyperion Process Upgrades	66	8	23	21	2	13	5	5
Tillman 100-mgd	17	2	12	8	1	8	7	7
Tillman Storage	29	4	18	14	1	1	4	3
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	116	16	81	45	7	19	9	6
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>228</b>	<b>30</b>	<b>134</b>	<b>89</b>	<b>11</b>	<b>41</b>	<b>25</b>	<b>21</b>
<b>2010</b>								
Hyperion Process Upgrades	139	18	64	60	6	64	16	14
Tillman 100-mgd	17	2	12	8	1	8	7	7
Tillman Storage	29	4	18	14	1	1	4	3
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	232	31	162	91	14	39	17	12
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>418</b>	<b>55</b>	<b>256</b>	<b>173</b>	<b>22</b>	<b>111</b>	<b>44</b>	<b>37</b>
<b>2011</b>								
Hyperion Process Upgrades	29	4	11	10	1	4	2	2
Tillman 100-mgd	17	2	12	8	1	8	7	7
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	232	31	162	91	14	39	17	12
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>599</b>	<b>81</b>	<b>394</b>	<b>216</b>	<b>37</b>	<b>93</b>	<b>48</b>	<b>36</b>
<b>2012</b>								
Hyperion Process Upgrades	-	-	-	-	-	-	-	-
Tillman 100-mgd	38	5	24	14	2	23	10	9
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	116	16	81	45	7	19	9	6
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>475</b>	<b>64</b>	<b>315</b>	<b>167</b>	<b>30</b>	<b>85</b>	<b>40</b>	<b>30</b>
<b>2013</b>								
Hyperion Process Upgrades	-	-	-	-	-	-	-	-
Tillman 100-mgd	63	8	34	19	2	49	10	9
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>383</b>	<b>52</b>	<b>244</b>	<b>128</b>	<b>23</b>	<b>92</b>	<b>31</b>	<b>23</b>
<b>2014</b>								
Hyperion Process Upgrades	16	2	12	11	1	17	4	4
Tillman 100-mgd	380	49	197	107	15	154	39	33
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	320	43	210	108	21	43	22	14
<b>Total</b>	<b>716</b>	<b>95</b>	<b>419</b>	<b>226</b>	<b>37</b>	<b>213</b>	<b>64</b>	<b>51</b>
<b>2015</b>								
Hyperion Process Upgrades	35	5	26	24	2	28	8	7
Tillman 100-mgd	153	20	78	43	6	59	14	12
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>188</b>	<b>25</b>	<b>104</b>	<b>67</b>	<b>8</b>	<b>87</b>	<b>22</b>	<b>19</b>
<b>2016</b>								
Hyperion Process Upgrades	78	9	22	20	2	4	2	2
Tillman 100-mgd	153	20	78	43	6	59	14	12
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>231</b>	<b>29</b>	<b>100</b>	<b>63</b>	<b>8</b>	<b>62</b>	<b>17</b>	<b>14</b>
<b>2017</b>								
Hyperion Process Upgrades	78	9	22	20	2	4	2	2
Tillman 100-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	53	7	33	22	2	25	8	7
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>131</b>	<b>16</b>	<b>55</b>	<b>43</b>	<b>4</b>	<b>28</b>	<b>10</b>	<b>8</b>
<b>2018 &amp; 2019</b>								
Hyperion Process Upgrades	78	9	22	20	2	4	2	2
Tillman 100-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	52	7	30	22	1	18	7	6
NEIS II	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-
<b>Total</b>	<b>130</b>	<b>16</b>	<b>52</b>	<b>42</b>	<b>4</b>	<b>21</b>	<b>9</b>	<b>8</b>
<b>2020</b>								
Hyperion Process Upgrades	39	5	11	10	1	2	1	1
Tillman 100-mgd	-	-	-	-	-	-	-	-
Tillman Storage	-	-	-	-	-	-	-	-
LAG Storage	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-

ANNUAL CONSTRUCTION EMISSIONS (tons per year)

GBIS	-	-	-	-	-	-	-	-
Total	39	5	11	10	1	2	1	1

## Los Angeles County (South Coast Air Basin) Burden Emission Factors Calculation

### 2020

	LDA		HDT	
Daily VMT	136,370,000		11,552,000	
Daily Starts	24,935,000		2,471,720	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.67 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	236.25	0.003465	38.27	0.006626
ROG	27.35	0.000401	6.14	0.001063
NOX	20.4	0.000299	45.42	0.007864
SOX	0.55	0.000008	0.23	0.000040
PM10	5.17	0.000076	1.67	0.000289

### 2017

	LDA		HDT	
Daily VMT	132,133,000		11,233,000	
Daily Starts	24,150,400		2,418,010	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.65 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	297.77	0.004367	46.78	0.008099
ROG	33.18	0.000487	7.09	0.001227
NOX	26.03	0.000382	58.46	0.010121
SOX	0.53	0.000008	0.22	0.000038
PM10	5.01	0.000073	1.81	0.000313

### 2015

	LDA		HDT	
Daily VMT	129,355,000		10,974,000	
Daily Starts	23,639,100		2,386,850	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.60 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	350.58	0.005142	54.58	0.009449
ROG	38.48	0.000564	7.88	0.001364
NOX	54.07	0.000793	70.28	0.012168
SOX	0.52	0.000008	0.22	0.000038
PM10	4.91	0.000072	1.93	0.000334

### 2014

	LDA		HDT	
Daily VMT	127,974,000		10,805,000	
Daily Starts	23,385,400		2,372,460	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.55 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	380.73	0.005584	59.13	0.010237
ROG	41.61	0.000610	8.33	0.001442
NOX	34.17	0.000501	77.36	0.013393
SOX	0.52	0.000008	0.21	0.000036
PM10	4.86	0.000071	2	0.000346

## Los Angeles County (South Coast Air Basin) Burden Emission Factors Calculation

### 2013

	LDA		HDT	
Daily VMT	126,591,000		10,602,000	
Daily Starts	23,132,900		2,359,360	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.49 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	414.3	0.006076	64.26	0.011125
ROG	45.21	0.000663	8.84	0.001530
NOX	37.57	0.000551	85.26	0.014761
SOX	0.52	0.000008	0.21	0.000036
PM10	4.81	0.000071	2.09	0.000362

### 2012

	LDA		HDT	
Daily VMT	125,202,000		10,363,000	
Daily Starts	22,881,500		2,349,670	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.41 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	451.7	0.006625	70.65	0.012232
ROG	49.26	0.000722	9.46	0.001638
NOX	41.39	0.000607	94.05	0.016283
SOX	0.51	0.000007	0.2	0.000035
PM10	4.76	0.000070	2.18	0.000377

### 2011

	LDA		HDT	
Daily VMT	123,807,000		10,095,000	
Daily Starts	22,630,800		2,342,380	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.31 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	493.17	0.007233	77.65	0.013444
ROG	53.85	0.000790	10.14	0.001756
NOX	45.64	0.000669	103.72	0.017957
SOX	0.51	0.000007	0.2	0.000035
PM10	4.71	0.000069	2.29	0.000396

### 2010

	LDA		HDT	
Daily VMT	122,413,000		9,811,000	
Daily Starts	22,382,500		2,336,820	
Average Trip Length (daily VMT/Daily Starts)	5.47 miles		4.20 miles	
	<i>Tons/Day</i>	<i>Pounds/Mile</i>	<i>Tons/Day</i>	<i>Pounds/Mile</i>
CO	529.65	0.008653	84.21	0.017166
ROG	58.35	0.000953	10.65	0.002171
NOX	50	0.000817	116.36	0.023720
SOX	0.5	0.000008	0.19	0.000039
PM10	4.57	0.000075	2.35	0.000479

SOURCE: EMFAC2002

**ASSUMPTIONS**

Component	Workers			Supply Trucks			Biosolid Haul Trucks						
	Daily Trips	Trip		Daily Supply Trips	Supply Trip Distance	Daily Supply Truck VMT	Daily Trips (Kern County)	Trip		Daily VMT (Kern County)	Daily Trips (Terminal Island)	Trip Distance (Terminal Island)	Daily VMT (Terminal Island)
		Distance	Daily VMT					Distance (Kern County)	Daily VMT (Kern County)				
Hyperion Full Secondary	10	20	200	2	20	40	21	136	2,856	5	20	100	
Hyperion Process Upgrades	10	20	200	2	20	40	21	136	2,856	5	20	100	
Tillman 100 MGD	12	20	240	2	20	40	-	-	-	-	-	-	
Tillman 80 MGD	10	20	200	2	20	40	-	-	-	-	-	-	
Tillman Process	8	20	160	2	20	40	-	-	-	-	-	-	
Tillman Storage	0	20	-	2	20	40	-	-	-	-	-	-	
LAG 30 MGD	6	20	120	2	20	40	-	-	-	-	-	-	
LAG Storage	0	20	-	2	20	40	-	-	-	-	-	-	
NEISII Alignment 1	4	20	80	-	-	-	-	-	-	-	-	-	
NEIS II Alignment 2	4	20	80	-	-	-	-	-	-	-	-	-	
GBIS Alignment 1	4	20	80	-	-	-	-	-	-	-	-	-	
GBIS Alignment 2	4	20	80	-	-	-	-	-	-	-	-	-	
VSLIS	4	20	80	-	-	-	-	-	-	-	-	-	

Component	Workers			Supply Trucks			Biosolid Haul Trucks						
	Monthly Trips	Trip		Monthly Supply Trips	Supply Trip Distance	Monthly Supply VMT	Monthly Trips (Kern County)	Trip		Monthly VMT (Kern County)	Monthly Trips (Terminal Island)	Trip Distance (Terminal Island)	Monthly VMT (Terminal Island)
		Distance	Monthly VMT					Distance (Kern County)	Monthly VMT (Kern County)				
Hyperion Full Secondary	304	20	6,083	4	20	80	639	136	86,870	152	20	3,042	
Hyperion Process Upgrades	304	20	6,083	2	20	40	639	136	86,870	152	20	3,042	
Tillman 100 MGD	365	20	7,300	2	20	40	-	-	-	-	-	-	
Tillman 80 MGD	304	20	6,083	2	20	40	-	-	-	-	-	-	
Tillman Process	243	20	4,867	2	20	40	-	-	-	-	-	-	
Tillman Storage	-	20	-	2	20	40	-	-	-	-	-	-	
LAG 30 MGD	183	20	3,650	2	20	40	-	-	-	-	-	-	
LAG Storage	-	20	-	2	20	40	-	-	-	-	-	-	
NEISII Alignment 1	4	20	80	-	-	-	-	-	-	-	-	-	
NEIS II Alignment 2	4	20	80	-	-	-	-	-	-	-	-	-	
GBIS Alignment 1	4	20	80	-	-	-	-	-	-	-	-	-	
GBIS Alignment 2	4	20	80	-	-	-	-	-	-	-	-	-	
VSLIS	4	20	80	-	-	-	-	-	-	-	-	-	

**Emissions by Plant (VOC)**

<b>Plant</b>	<i>Hyperion - 500 MGD</i>	<i>Hyperion Process Upgrades</i>	<i>Tillman - 100 MGD</i>	<i>Tillman - 80 MGD</i>	<i>LAG</i>
<b>Existing Throughput (mgd)</b>	339	339	61.57	61.57	16.37
<b>Existing Capacity (mgd)</b>	450.00	450.00	64.00	64.00	15.00
<b>Emissions Factor (lbs/mgd)</b>	74.20	74.20	122.43	122.43	180.90
<b>Existing Emissions (lbs/year)</b>	25,153.80	25,153.80	7,537.92	7,537.92	2,961.33
<b>Existing Emissions (lbs/day)</b>	68.91	68.91	20.65	20.65	8.11
<b>Future Capacity (mgd)</b>	500.00	450.00	100.00	80.00	30.00
<b>Increase in Throughput</b>	47%	33%	62%	30%	83%
<b>New Emissions from Project (lbs/year)</b>	11,946.20	8,236.20	4,704.93	2,256.36	2,465.67
<b>New Emissions from Project (tons/year)</b>	5.97	4.12	2.35	1.13	1.23
<b>New Emissions from Project (lbs/day)</b>	32.73	22.56	12.89	6.18	6.76

**OPERATIONAL EMISSIONS SUMMARY (2010)**

**MOBILE SOURCE EMISSIONS (2010)**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	8.9	1.1	11.9	0.0	0.2
Hyperion Process Upgrades	13.3	1.7	17.8	0.0	0.4
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage (Alt 1, 2, & 3)	0.3	0.0	0.5	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	266.2	33.5	356.6	0.6	7.3
Hyperion Process Upgrades	399.2	50.3	534.7	0.9	10.9
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.3	0.0	0.5	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	1.6	0.2	2.1	0.0	0.0
Hyperion Process Upgrades	2.4	0.3	3.2	0.0	0.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**OPERATIONAL EMISSIONS SUMMARY (2010)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2010)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		5.5			
Hyperion Process Upgrades		5.6			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		1.0			
Hyperion Process Upgrades		1.0			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2010)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2010)**

	CO	ROG	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary	8.9	6.6	11.9	0.0	0.2
Hyperion Process Upgrades	13.3	7.3	17.8	0.0	0.4
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.3	0.0	0.5	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	1.6	1.2	2.1	0.0	0.0
Hyperion Process Upgrades	2.4	1.3	3.2	0.0	0.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**Operational Emissions by Alternatives (2010)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	8.9	6.6	11.9	0.0	0.2	1.6	1.2	2.1	0.0	0.0
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>9.2</i>	<i>6.6</i>	<i>12.3</i>	<i>0.0</i>	<i>0.3</i>	<i>1.6</i>	<i>1.2</i>	<i>2.1</i>	<i>0.0</i>	<i>0.0</i>
<i>Total (w/ electricity consumption)</i>	<i>24.0</i>	<i>11.3</i>	<i>18.0</i>	<i>0.5</i>	<i>3.2</i>	<i>4.3</i>	<i>2.1</i>	<i>3.2</i>	<i>0.1</i>	<i>0.6</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	13.3	7.3	17.8	0.0	0.4	2.4	1.3	3.2	0.0	0.1
Tillman 80 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>13.6</i>	<i>7.4</i>	<i>18.3</i>	<i>0.0</i>	<i>0.4</i>	<i>2.4</i>	<i>1.3</i>	<i>3.2</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>25.1</i>	<i>11.0</i>	<i>22.7</i>	<i>0.4</i>	<i>2.7</i>	<i>4.5</i>	<i>2.0</i>	<i>4.0</i>	<i>0.1</i>	<i>0.5</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	13.3	7.3	17.8	0.0	0.4	2.4	1.3	3.2	0.0	0.1
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>13.6</i>	<i>7.4</i>	<i>18.3</i>	<i>0.0</i>	<i>0.4</i>	<i>2.4</i>	<i>1.3</i>	<i>3.2</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>25.1</i>	<i>11.0</i>	<i>22.7</i>	<i>0.4</i>	<i>2.7</i>	<i>4.5</i>	<i>2.0</i>	<i>4.0</i>	<i>0.1</i>	<i>0.5</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	13.3	7.3	17.8	0.0	0.4	2.4	1.3	3.2	0.0	0.1
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>13.6</i>	<i>7.4</i>	<i>18.3</i>	<i>0.0</i>	<i>0.4</i>	<i>2.4</i>	<i>1.3</i>	<i>3.2</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>24.9</i>	<i>10.9</i>	<i>22.6</i>	<i>0.4</i>	<i>2.6</i>	<i>4.46</i>	<i>1.98</i>	<i>4.00</i>	<i>0.07</i>	<i>0.48</i>

**OPERATIONAL EMISSIONS SUMMARY (2011)**

**MOBILE SOURCE EMISSIONS (2011)**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	13.9	1.8	18.0	0.0	0.4
Hyperion Process Upgrades	20.9	2.7	27.0	0.1	0.6
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage (Alt 1, 2, & 3)	0.5	0.1	0.7	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	417.9	54.3	540.0	1.1	12.0
Hyperion Process Upgrades	626.6	81.4	809.7	1.6	18.0
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.5	0.1	0.7	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	2.5	0.3	3.2	0.0	0.1
Hyperion Process Upgrades	3.8	0.5	4.9	0.0	0.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**OPERATIONAL EMISSIONS SUMMARY (2011)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2011)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		10.9			
Hyperion Process Upgrades		11.3			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		2.0			
Hyperion Process Upgrades		2.1			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2011)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2011)**

	CO	ROG	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary	13.9	12.7	18.0	0.0	0.4
Hyperion Process Upgrades	20.9	14.0	27.0	0.1	0.6
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.5	0.1	0.7	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	2.5	2.3	3.2	0.0	0.1
Hyperion Process Upgrades	3.8	2.5	4.9	0.0	0.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	-	-	-	-	-
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	-	-	-	-	-
NEIS II Alignment 2	-	-	-	-	-
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**Operational Emissions by Alternatives (2011)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	13.9	12.7	18.0	0.0	0.4	2.5	2.3	3.2	0.0	0.1
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>14.4</i>	<i>12.8</i>	<i>18.7</i>	<i>0.0</i>	<i>0.4</i>	<i>2.5</i>	<i>2.3</i>	<i>3.2</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>29.4</i>	<i>17.5</i>	<i>24.4</i>	<i>0.5</i>	<i>3.4</i>	<i>5.2</i>	<i>3.2</i>	<i>4.3</i>	<i>0.1</i>	<i>0.6</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	20.9	14.0	27.0	0.1	0.6	3.8	2.5	4.9	0.0	0.1
Tillman 80 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>21.4</i>	<i>14.1</i>	<i>27.7</i>	<i>0.1</i>	<i>0.6</i>	<i>3.8</i>	<i>2.5</i>	<i>4.9</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>33.0</i>	<i>17.7</i>	<i>32.1</i>	<i>0.4</i>	<i>2.9</i>	<i>5.9</i>	<i>3.2</i>	<i>5.7</i>	<i>0.1</i>	<i>0.5</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	20.9	14.0	27.0	0.1	0.6	3.8	2.5	4.9	0.0	0.1
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>21.4</i>	<i>14.1</i>	<i>27.7</i>	<i>0.1</i>	<i>0.6</i>	<i>3.8</i>	<i>2.5</i>	<i>4.9</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>33.0</i>	<i>17.7</i>	<i>32.1</i>	<i>0.4</i>	<i>2.9</i>	<i>5.9</i>	<i>3.2</i>	<i>5.7</i>	<i>0.1</i>	<i>0.5</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	20.9	14.0	27.0	0.1	0.6	3.8	2.5	4.9	0.0	0.1
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	-	-	-	-	-	-	-	-	-	-
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	-	-	-	-	-	-	-	-	-	-
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>21.4</i>	<i>14.1</i>	<i>27.7</i>	<i>0.1</i>	<i>0.6</i>	<i>3.8</i>	<i>2.5</i>	<i>4.9</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>32.7</i>	<i>17.6</i>	<i>32.0</i>	<i>0.4</i>	<i>2.9</i>	<i>5.83</i>	<i>3.20</i>	<i>5.65</i>	<i>0.07</i>	<i>0.52</i>

**OPERATIONAL EMISSIONS SUMMARY (2012)**

**MOBILE SOURCE EMISSIONS (2012)**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	25.3	3.4	32.6	0.1	0.8
Hyperion Process Upgrades	38.0	5.1	48.9	0.1	1.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	1.5	0.2	0.7	0.0	0.0
Tillman Storage (Alt 1, 2, & 3)	0.5	0.1	0.7	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	760.7	101.2	979.3	2.1	22.9
Hyperion Process Upgrades	1,140.6	151.7	1,468.4	3.2	34.4
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	32.7	3.6	3.6	0.0	0.4
Tillman Storage	0.5	0.1	0.7	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	4.6	0.6	5.9	0.0	0.1
Hyperion Process Upgrades	6.8	0.9	8.8	0.0	0.2
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**OPERATIONAL EMISSIONS SUMMARY (2012)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2012)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		21.8			
Hyperion Process Upgrades		22.6			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		4.0			
Hyperion Process Upgrades		4.1			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2012)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2012)**

	<b>CO</b>	<b>ROG</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	25.3	25.2	32.6	0.1	0.8
Hyperion Process Upgrades	38.0	27.6	48.9	0.1	1.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	1.5	0.2	0.7	0.0	0.0
Tillman Storage	0.5	0.1	0.7	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	4.6	4.6	5.9	0.0	0.1
Hyperion Process Upgrades	6.8	5.0	8.8	0.0	0.2
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**Operational Emissions by Alternatives (2012)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	25.3	25.2	32.6	0.1	0.8	4.6	4.6	5.9	0.0	0.1
Tillman Process Upgrades	1.5	0.2	0.7	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>27.6</i>	<i>25.5</i>	<i>34.0</i>	<i>0.1</i>	<i>0.8</i>	<i>4.6</i>	<i>4.6</i>	<i>5.9</i>	<i>0.0</i>	<i>0.1</i>
<i>Total (w/ electricity consumption)</i>	<i>99.8</i>	<i>48.2</i>	<i>61.6</i>	<i>2.3</i>	<i>15.2</i>	<i>17.7</i>	<i>8.7</i>	<i>10.9</i>	<i>0.4</i>	<i>2.8</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	38.0	27.6	48.9	0.1	1.1	6.8	5.0	8.8	0.0	0.2
Tillman 80 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	1.5	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-	-	-	-	-	-
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>40.3</i>	<i>27.9</i>	<i>50.3</i>	<i>0.1</i>	<i>1.2</i>	<i>7.0</i>	<i>5.1</i>	<i>8.8</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>63.5</i>	<i>35.2</i>	<i>59.2</i>	<i>0.8</i>	<i>5.8</i>	<i>11.3</i>	<i>6.4</i>	<i>10.5</i>	<i>0.1</i>	<i>1.1</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	38.0	27.6	48.9	0.1	1.1	6.8	5.0	8.8	0.0	0.2
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	1.5	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>40.3</i>	<i>27.9</i>	<i>50.3</i>	<i>0.1</i>	<i>1.2</i>	<i>7.0</i>	<i>5.1</i>	<i>8.8</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>63.5</i>	<i>35.2</i>	<i>59.2</i>	<i>0.8</i>	<i>5.8</i>	<i>11.3</i>	<i>6.4</i>	<i>10.5</i>	<i>0.1</i>	<i>1.1</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	38.0	27.6	48.9	0.1	1.1	6.8	5.0	8.8	0.0	0.2
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	1.5	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>40.3</i>	<i>27.9</i>	<i>50.3</i>	<i>0.1</i>	<i>1.2</i>	<i>7.0</i>	<i>5.1</i>	<i>8.8</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>63.5</i>	<i>35.2</i>	<i>59.2</i>	<i>0.8</i>	<i>5.8</i>	<i>11.29</i>	<i>6.39</i>	<i>10.46</i>	<i>0.15</i>	<i>1.06</i>

**OPERATIONAL EMISSIONS SUMMARY (2013)**

**MOBILE SOURCE EMISSIONS (2013)**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	28.8	3.9	36.9	0.1	0.9
Hyperion Process Upgrades	34.5	4.7	44.3	0.1	1.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	1.4	0.2	0.7	0.0	0.0
Tillman Storage (Alt 1, 2, & 3)	0.4	0.1	0.6	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.5	0.1	0.0	0.0	0.0
NEIS II Alignment 2	0.5	0.1	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	865.1	118.1	1,109.8	2.8	27.5
Hyperion Process Upgrades	1,037.7	141.7	1,331.1	3.3	33.0
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	30.0	3.3	3.3	0.0	0.4
Tillman Storage	0.4	0.1	0.6	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.5	0.1	0.0	0.0	0.0
NEIS II Alignment 2	0.9	0.1	1.2	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	5.2	0.7	6.7	0.0	0.2
Hyperion Process Upgrades	6.2	0.9	8.0	0.0	0.2
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**OPERATIONAL EMISSIONS SUMMARY (2013)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2013)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		27.3			
Hyperion Process Upgrades		22.6			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		5.0			
Hyperion Process Upgrades		4.1			
Tillman 100 MGD					
Tillman 80 MGD					
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2013)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2013)**

	<b>CO</b>	<b>ROG</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	28.8	31.2	36.9	0.1	0.9
Hyperion Process Upgrades	34.5	27.3	44.3	0.1	1.1
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	1.4	0.2	0.7	0.0	0.0
Tillman Storage	0.4	0.1	0.6	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.5	0.1	0.0	0.0	0.0
NEIS II Alignment 2	0.5	0.1	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	5.2	5.7	6.7	0.0	0.2
Hyperion Process Upgrades	6.2	5.0	8.0	0.0	0.2
Tillman 100 MGD	-	-	-	-	-
Tillman 80 MGD	-	-	-	-	-
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**Operational Emissions by Alternatives (2013)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	28.8	31.2	36.9	0.1	0.9	5.2	5.7	6.7	0.0	0.2
Tillman Process Upgrades	1.4	0.2	0.7	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>31.1</i>	<i>31.5</i>	<i>38.3</i>	<i>0.1</i>	<i>1.0</i>	<i>5.2</i>	<i>5.7</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>103.5</i>	<i>54.3</i>	<i>65.9</i>	<i>2.3</i>	<i>15.4</i>	<i>18.4</i>	<i>9.8</i>	<i>11.7</i>	<i>0.4</i>	<i>2.8</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	34.5	27.3	44.3	0.1	1.1	6.2	5.0	8.0	0.0	0.2
Tillman 80 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	1.4	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-	-	-	-	-	-
NEIS II	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>36.9</i>	<i>27.6</i>	<i>45.6</i>	<i>0.1</i>	<i>1.1</i>	<i>6.4</i>	<i>5.0</i>	<i>8.0</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>89.1</i>	<i>44.0</i>	<i>65.6</i>	<i>1.7</i>	<i>11.6</i>	<i>15.9</i>	<i>8.0</i>	<i>11.6</i>	<i>0.3</i>	<i>2.1</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	34.5	27.3	44.3	0.1	1.1	6.2	5.0	8.0	0.0	0.2
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	1.4	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>36.9</i>	<i>27.6</i>	<i>45.6</i>	<i>0.1</i>	<i>1.1</i>	<i>6.4</i>	<i>5.0</i>	<i>8.0</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>60.2</i>	<i>34.9</i>	<i>54.5</i>	<i>0.8</i>	<i>5.8</i>	<i>10.7</i>	<i>6.3</i>	<i>9.6</i>	<i>0.1</i>	<i>1.0</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	34.5	27.3	44.3	0.1	1.1	6.2	5.0	8.0	0.0	0.2
Tillman 100 MGD	-	-	-	-	-	-	-	-	-	-
Tillman Process Upgrades	1.4	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>36.9</i>	<i>27.6</i>	<i>45.6</i>	<i>0.1</i>	<i>1.1</i>	<i>6.4</i>	<i>5.0</i>	<i>8.0</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>60.2</i>	<i>34.9</i>	<i>54.5</i>	<i>0.8</i>	<i>5.8</i>	<i>10.66</i>	<i>6.33</i>	<i>9.63</i>	<i>0.15</i>	<i>1.05</i>

**OPERATIONAL EMISSIONS SUMMARY (2014)**

**MOBILE SOURCE EMISSIONS (2014)**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	31.8	4.4	40.2	0.1	1.1
Hyperion Process Upgrades	31.8	4.4	40.2	0.1	1.1
Tillman 100 MGD	0.9	0.1	0.3	0.0	0.0
Tillman 80 MGD	1.5	0.2	0.6	0.0	0.0
Tillman Process	1.3	0.2	0.6	0.0	0.0
Tillman Storage (Alt 1, 2, & 3)	0.4	0.1	0.5	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.4	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.4	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	955.2	133.5	1,208.3	3.3	31.6
Hyperion Process Upgrades	954.8	133.4	1,207.8	3.3	31.6
Tillman 100 MGD	20.6	2.3	2.1	0.0	0.3
Tillman 80 MGD	34.4	3.8	3.6	0.0	0.4
Tillman Process	27.6	3.0	3.0	0.0	0.4
Tillman Storage	0.4	0.1	0.5	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.4	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.4	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	5.7	0.8	7.3	0.0	0.2
Hyperion Process Upgrades	5.7	0.8	7.2	0.0	0.2
Tillman 100 MGD	0.1	0.0	0.0	0.0	0.0
Tillman 80 MGD	0.2	0.0	0.0	0.0	0.0
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**OPERATIONAL EMISSIONS SUMMARY (2014)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2014)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		32.7			
Hyperion Process Upgrades		22.6			
Tillman 100 MGD		6.4			
Tillman 80 MGD		6.2			
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		6.0			
Hyperion Process Upgrades		4.1			
Tillman 100 MGD		1.2			
Tillman 80 MGD		1.1			
Tillman Process					
Tillman Storage					
LAG 30 MGD					
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2014)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2014)**

	<b>CO</b>	<b>ROG</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	31.8	37.2	40.2	0.1	1.1
Hyperion Process Upgrades	31.8	27.0	40.2	0.1	1.1
Tillman 100 MGD	0.9	6.5	0.3	0.0	0.0
Tillman 80 MGD	1.5	6.4	0.6	0.0	0.0
Tillman Process	1.3	0.2	0.6	0.0	0.0
Tillman Storage	0.4	0.1	0.5	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.4	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.4	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	5.7	6.8	7.3	0.0	0.2
Hyperion Process Upgrades	5.7	4.9	7.2	0.0	0.2
Tillman 100 MGD	0.1	1.2	0.0	0.0	0.0
Tillman 80 MGD	0.2	1.2	0.0	0.0	0.0
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-
LAG Storage	-	-	-	-	-
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	-	-	-	-	-
GBIS Alignment 2	-	-	-	-	-
VSLIS	-	-	-	-	-

**Operational Emissions by Alternatives (2014)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	31.8	37.2	40.2	0.1	1.1	5.7	6.8	7.3	0.0	0.2
Tillman Process Upgrades	1.3	0.2	0.6	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>33.9</i>	<i>37.4</i>	<i>41.4</i>	<i>0.1</i>	<i>1.1</i>	<i>5.7</i>	<i>6.8</i>	<i>7.3</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>106.5</i>	<i>60.3</i>	<i>69.1</i>	<i>2.3</i>	<i>15.6</i>	<i>19.0</i>	<i>10.9</i>	<i>12.3</i>	<i>0.4</i>	<i>2.8</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	31.8	27.0	40.2	0.1	1.1	5.7	4.9	7.2	0.0	0.2
Tillman 80 MGD	1.5	6.4	0.6	0.0	0.0	0.2	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.3	0.2	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	-	-	-	-	-	-	-	-	-	-
NEIS II	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>35.5</i>	<i>33.6</i>	<i>42.1</i>	<i>0.1</i>	<i>1.1</i>	<i>6.1</i>	<i>6.1</i>	<i>7.3</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>117.5</i>	<i>59.5</i>	<i>73.4</i>	<i>2.6</i>	<i>17.5</i>	<i>21.1</i>	<i>10.8</i>	<i>13.0</i>	<i>0.5</i>	<i>3.2</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	31.8	27.0	40.2	0.1	1.1	5.7	4.9	7.2	0.0	0.2
Tillman 100 MGD	0.9	6.5	0.3	0.0	0.0	0.1	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.3	0.2	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>34.8</i>	<i>33.8</i>	<i>41.7</i>	<i>0.1</i>	<i>1.1</i>	<i>6.0</i>	<i>6.1</i>	<i>7.3</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>116.9</i>	<i>59.7</i>	<i>73.1</i>	<i>2.6</i>	<i>17.5</i>	<i>21.0</i>	<i>10.8</i>	<i>13.0</i>	<i>0.5</i>	<i>3.2</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	31.8	27.0	40.2	0.1	1.1	5.7	4.9	7.2	0.0	0.2
Tillman 100 MGD	0.9	6.5	0.3	0.0	0.0	0.1	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.3	0.2	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	-	-	-	-	-	-	-	-	-
NEIS II	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	-	-	-	-	-	-	-	-	-	-
<i>Total (w/o electricity consumption)</i>	<i>34.8</i>	<i>33.8</i>	<i>41.7</i>	<i>0.1</i>	<i>1.1</i>	<i>6.0</i>	<i>6.1</i>	<i>7.3</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>116.9</i>	<i>59.7</i>	<i>73.1</i>	<i>2.6</i>	<i>17.5</i>	<i>20.99</i>	<i>10.85</i>	<i>13.00</i>	<i>0.47</i>	<i>3.19</i>

**OPERATIONAL EMISSIONS SUMMARY (2015 & 2016)**

**MOBILE SOURCE EMISSIONS (2015)**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	29.3	4.2	36.6	0.1	1.0
Hyperion Process Upgrades	29.3	4.2	36.6	0.1	1.0
Tillman 100 MGD	0.8	0.1	0.3	0.0	0.0
Tillman 80 MGD	1.4	0.2	0.6	0.0	0.0
Tillman Process	1.2	0.1	0.6	0.0	0.0
Tillman Storage (Alt 1, 2, & 3)	0.4	0.1	0.5	0.0	0.0
LAG 30 MGD	1.0	0.1	0.6	0.0	0.0
LAG Storage	-	1.0	2.0	3.0	4.0
NEISII Alignment 1	0.4	0.0	0.1	0.0	0.0
NEIS II Alignment 2	0.4	0.0	0.1	0.0	0.0
GBIS Alignment 1	0.4	0.0	0.1	0.0	0.0
GBIS Alignment 2	0.4	0.0	0.1	0.0	0.0
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	881.7	126.2	1,099.8	3.5	30.5
Hyperion Process Upgrades	881.3	126.2	1,099.3	3.5	30.5
Tillman 100 MGD	19.0	2.1	3.1	0.0	0.3
Tillman 80 MGD	31.7	3.5	5.3	0.0	0.5
Tillman Process	25.4	2.8	4.3	0.0	0.4
Tillman Storage	0.4	0.1	0.5	0.0	0.0
LAG 30 MGD	19.1	2.1	3.4	0.0	0.3
LAG Storage	-	1.0	2.0	3.0	4.0
NEISII Alignment 1	0.4	0.0	0.1	0.0	0.0
NEIS II Alignment 2	0.4	0.0	0.1	0.0	0.0
GBIS Alignment 1	0.4	0.0	0.1	0.0	0.0
GBIS Alignment 2	0.4	0.0	0.1	0.0	0.0
VSLIS	-	1.0	2.0	3.0	4.0
<b>Tons Per Year</b>					
Hyperion Full Secondary	5.3	0.8	6.6	0.0	0.2
Hyperion Process Upgrades	5.3	0.8	6.6	0.0	0.2
Tillman 100 MGD	0.1	0.0	0.0	0.0	0.0
Tillman 80 MGD	0.2	0.0	0.0	0.0	0.0
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.1	0.0	0.0	0.0	0.0
LAG Storage	-	0.0	0.0	0.0	0.0
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.0	0.0	0.0	0.0	0.0
VSLIS	-	0.0	0.0	0.0	0.0

**OPERATIONAL EMISSIONS SUMMARY (2015 & 2016)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2015 & 2016)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		32.7			
Hyperion Process Upgrades		22.6			
Tillman 100 MGD		6.4			
Tillman 80 MGD		6.2			
Tillman Process					
Tillman Storage					
LAG 30 MGD		6.8			
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		6.0			
Hyperion Process Upgrades		4.1			
Tillman 100 MGD		1.2			
Tillman 80 MGD		1.1			
Tillman Process					
Tillman Storage					
LAG 30 MGD		1.2			
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2015 & 2016)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2015 & 2016)**

	CO	ROG	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary	29.3	36.9	36.6	0.1	1.0
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0
Tillman 100 MGD	0.8	6.5	0.3	0.0	0.0
Tillman 80 MGD	1.4	6.3	0.6	0.0	0.0
Tillman Process	1.2	0.1	0.6	0.0	0.0
Tillman Storage	0.4	0.1	0.5	0.0	0.0
LAG 30 MGD	1.0	6.9	0.6	0.0	0.0
LAG Storage	-	1.0	2.0	3.0	4.0
NEISII Alignment 1	0.4	0.0	0.1	0.0	0.0
NEIS II Alignment 2	0.4	0.0	0.1	0.0	0.0
GBIS Alignment 1	0.4	0.0	0.1	0.0	0.0
GBIS Alignment 2	0.4	0.0	0.1	0.0	0.0
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	5.3	6.7	6.6	0.0	0.2
Hyperion Process Upgrades	5.3	4.9	6.6	0.0	0.2
Tillman 100 MGD	0.1	1.2	0.0	0.0	0.0
Tillman 80 MGD	0.2	1.1	0.0	0.0	0.0
Tillman Process	0.2	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.1	1.2	0.0	0.0	0.0
LAG Storage	-	0.0	0.0	0.0	0.0
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.0	0.0	0.0	0.0	0.0
VSLIS	-	0.0	0.0	0.0	0.0

**Operational Emissions by Alternatives (2015)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	29.3	36.9	36.6	0.1	1.0	5.3	6.7	6.6	0.0	0.2
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>31.8</i>	<i>38.2</i>	<i>39.9</i>	<i>3.1</i>	<i>5.1</i>	<i>5.3</i>	<i>6.7</i>	<i>6.6</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>104.3</i>	<i>61.1</i>	<i>67.6</i>	<i>5.3</i>	<i>19.6</i>	<i>18.5</i>	<i>10.9</i>	<i>11.7</i>	<i>0.4</i>	<i>2.9</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0	5.3	4.9	6.6	0.0	0.2
Tillman 80 MGD	1.4	6.3	0.6	0.0	0.0	0.2	1.1	0.0	0.0	0.0
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	1.0	6.9	0.6	0.0	0.0	0.1	1.2	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>34.2</i>	<i>40.3</i>	<i>39.1</i>	<i>0.1</i>	<i>1.1</i>	<i>5.8</i>	<i>7.3</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>145.1</i>	<i>75.3</i>	<i>81.5</i>	<i>3.5</i>	<i>23.3</i>	<i>26.0</i>	<i>13.7</i>	<i>14.4</i>	<i>0.6</i>	<i>4.2</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0	5.3	4.9	6.6	0.0	0.2
Tillman 100 MGD	0.8	6.5	0.3	0.0	0.0	0.1	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>32.6</i>	<i>34.6</i>	<i>40.2</i>	<i>3.1</i>	<i>5.1</i>	<i>5.6</i>	<i>6.1</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>114.6</i>	<i>60.5</i>	<i>71.5</i>	<i>5.6</i>	<i>21.5</i>	<i>20.5</i>	<i>10.8</i>	<i>12.4</i>	<i>0.5</i>	<i>3.2</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0	5.3	4.9	6.6	0.0	0.2
Tillman 100 MGD	0.8	6.5	0.3	0.0	0.0	0.1	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>32.6</i>	<i>34.6</i>	<i>40.2</i>	<i>3.1</i>	<i>5.1</i>	<i>5.6</i>	<i>6.1</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>114.6</i>	<i>60.5</i>	<i>71.5</i>	<i>5.6</i>	<i>21.5</i>	<i>20.53</i>	<i>10.81</i>	<i>12.37</i>	<i>0.49</i>	<i>3.21</i>

**Operational Emissions by Alternatives (2016)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	29.3	36.9	36.6	0.1	1.0	5.3	6.7	6.6	0.0	0.2
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>31.8</i>	<i>38.2</i>	<i>39.9</i>	<i>3.1</i>	<i>5.1</i>	<i>5.3</i>	<i>6.7</i>	<i>6.6</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>104.3</i>	<i>61.1</i>	<i>67.6</i>	<i>5.3</i>	<i>19.6</i>	<i>18.5</i>	<i>10.9</i>	<i>11.7</i>	<i>0.4</i>	<i>2.9</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0	5.3	4.9	6.6	0.0	0.2
Tillman 80 MGD	1.4	6.3	0.6	0.0	0.0	0.2	1.1	0.0	0.0	0.0
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	1.0	6.9	0.6	0.0	0.0	0.1	1.2	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>34.2</i>	<i>40.3</i>	<i>39.1</i>	<i>0.1</i>	<i>1.1</i>	<i>5.8</i>	<i>7.3</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>145.1</i>	<i>75.3</i>	<i>81.5</i>	<i>3.5</i>	<i>23.3</i>	<i>26.0</i>	<i>13.7</i>	<i>14.4</i>	<i>0.6</i>	<i>4.2</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0	5.3	4.9	6.6	0.0	0.2
Tillman 100 MGD	0.8	6.5	0.3	0.0	0.0	0.1	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>32.6</i>	<i>34.6</i>	<i>40.2</i>	<i>3.1</i>	<i>5.1</i>	<i>5.6</i>	<i>6.1</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>114.6</i>	<i>60.5</i>	<i>71.5</i>	<i>5.6</i>	<i>21.5</i>	<i>20.5</i>	<i>10.8</i>	<i>12.4</i>	<i>0.5</i>	<i>3.2</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	29.3	26.8	36.6	0.1	1.0	5.3	4.9	6.6	0.0	0.2
Tillman 100 MGD	0.8	6.5	0.3	0.0	0.0	0.1	1.2	0.0	0.0	0.0
Tillman Process Upgrades	1.2	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.4	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>32.6</i>	<i>34.6</i>	<i>40.2</i>	<i>3.1</i>	<i>5.1</i>	<i>5.6</i>	<i>6.1</i>	<i>6.7</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>114.6</i>	<i>60.5</i>	<i>71.5</i>	<i>5.6</i>	<i>21.5</i>	<i>20.53</i>	<i>10.81</i>	<i>12.37</i>	<i>0.49</i>	<i>3.21</i>

**OPERATIONAL EMISSIONS SUMMARY (2017 through 2019)**

**MOBILE SOURCE EMISSIONS (2017 through 2019)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary	25.1	3.8	30.4	0.1	1.0
Hyperion Process Upgrades	25.1	3.8	30.4	0.1	1.0
Tillman 100 MGD	1.4	0.2	0.5	0.0	0.0
Tillman 80 MGD	1.2	0.1	0.5	0.0	0.0
Tillman Process	1.0	0.1	0.5	0.0	0.0
Tillman Storage (Alt 1, 2, & 3)	0.3	0.0	0.4	0.0	0.0
LAG 30 MGD	0.8	0.1	0.5	0.0	0.0
LAG Storage	-	1.0	2.0	3.0	4.0
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.3	0.0	0.0	0.0	0.0
VSLIS	-	-	-	-	-
<b>Pounds per Month</b>					
Hyperion Full Secondary	755.4	113.4	913.1	3.5	28.6
Hyperion Process Upgrades	755.1	113.4	912.7	3.5	28.6
Tillman 100 MGD	32.2	3.6	3.2	0.1	0.5
Tillman 80 MGD	26.9	3.0	2.7	0.0	0.5
Tillman Process	21.6	2.4	2.3	0.0	0.4
Tillman Storage	0.3	0.0	0.4	0.0	0.0
LAG 30 MGD	16.3	1.8	1.8	0.0	0.3
LAG Storage	-	1.0	2.0	3.0	4.0
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.3	0.0	0.0	0.0	0.0
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	4.5	0.7	5.5	0.0	0.2
Hyperion Process Upgrades	4.5	0.7	5.5	0.0	0.2
Tillman 100 MGD	0.2	0.0	0.0	0.0	0.0
Tillman 80 MGD	0.2	0.0	0.0	0.0	0.0
Tillman Process	0.1	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.1	0.0	0.0	0.0	0.0
LAG Storage	-	0.0	0.0	0.0	0.0
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.0	0.0	0.0	0.0	0.0
VSLIS	-	-	-	-	-

**OPERATIONAL EMISSIONS SUMMARY (2017 through 2019)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2017 through 2019)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		32.7			
Hyperion Process Upgrades		22.6			
Tillman 100 MGD		12.9			
Tillman 80 MGD		6.2			
Tillman Process					
Tillman Storage					
LAG 30 MGD		6.8			
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		6.0			
Hyperion Process Upgrades		4.1			
Tillman 100 MGD		2.4			
Tillman 80 MGD		1.1			
Tillman Process					
Tillman Storage					
LAG 30 MGD		1.2			
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2017 through 2019)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2017 through 2019)**

	CO	ROG	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary	25.1	36.5	30.4	0.1	1.0
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0
Tillman 100 MGD	1.4	13.1	0.5	0.0	0.0
Tillman 80 MGD	1.2	6.3	0.5	0.0	0.0
Tillman Process	1.0	0.1	0.5	0.0	0.0
Tillman Storage	0.3	0.0	0.4	0.0	0.0
LAG 30 MGD	0.8	6.9	0.5	0.0	0.0
LAG Storage	-	1.0	2.0	3.0	4.0
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.3	0.0	0.0	0.0	0.0
VSLIS	-	-	-	-	-
<b>Tons Per Year</b>					
Hyperion Full Secondary	4.5	6.7	5.5	0.0	0.2
Hyperion Process Upgrades	4.5	4.8	5.5	0.0	0.2
Tillman 100 MGD	0.2	2.4	0.0	0.0	0.0
Tillman 80 MGD	0.2	1.1	0.0	0.0	0.0
Tillman Process	0.1	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.1	1.2	0.0	0.0	0.0
LAG Storage	-	0.0	0.0	0.0	0.0
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.0	0.0	0.0	0.0	0.0
VSLIS	-	-	-	-	-

**Operational Emissions by Alternatives (2017 & 2018')**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	25.1	36.5	30.4	0.1	1.0	4.5	6.7	5.5	0.0	0.2
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>27.2</i>	<i>37.8</i>	<i>33.3</i>	<i>3.1</i>	<i>5.0</i>	<i>4.5</i>	<i>6.7</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>99.7</i>	<i>60.6</i>	<i>61.0</i>	<i>5.3</i>	<i>19.5</i>	<i>17.8</i>	<i>10.8</i>	<i>10.5</i>	<i>0.4</i>	<i>2.8</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0	4.5	4.8	5.5	0.0	0.2
Tillman 80 MGD	1.2	6.3	0.5	0.0	0.0	0.2	1.1	0.0	0.0	0.0
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.8	6.9	0.5	0.0	0.0	0.1	1.2	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>29.2</i>	<i>39.8</i>	<i>32.3</i>	<i>0.1</i>	<i>1.1</i>	<i>4.9</i>	<i>7.2</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>140.2</i>	<i>74.8</i>	<i>74.6</i>	<i>3.5</i>	<i>23.2</i>	<i>25.2</i>	<i>13.6</i>	<i>13.3</i>	<i>0.6</i>	<i>4.2</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0	4.5	4.8	5.5	0.0	0.2
Tillman 100 MGD	1.4	13.1	0.5	0.0	0.0	0.2	2.4	0.0	0.0	0.0
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>28.6</i>	<i>40.6</i>	<i>33.8</i>	<i>3.1</i>	<i>5.0</i>	<i>4.9</i>	<i>7.2</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>130.9</i>	<i>72.9</i>	<i>72.9</i>	<i>6.2</i>	<i>25.5</i>	<i>23.5</i>	<i>13.1</i>	<i>12.7</i>	<i>0.6</i>	<i>3.9</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0	4.5	4.8	5.5	0.0	0.2
Tillman 100 MGD	1.4	13.1	0.5	0.0	0.0	0.2	2.4	0.0	0.0	0.0
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>28.6</i>	<i>40.6</i>	<i>33.8</i>	<i>3.1</i>	<i>5.0</i>	<i>4.9</i>	<i>7.2</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>130.9</i>	<i>72.9</i>	<i>72.9</i>	<i>6.2</i>	<i>25.5</i>	<i>23.54</i>	<i>13.08</i>	<i>12.66</i>	<i>0.61</i>	<i>3.94</i>

**Operational Emissions by Alternatives (2019)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	25.1	36.5	30.4	0.1	1.0	4.5	6.7	5.5	0.0	0.2
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	-	-	-	-	-
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>27.2</i>	<i>37.8</i>	<i>33.3</i>	<i>3.1</i>	<i>5.0</i>	<i>4.5</i>	<i>6.7</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>99.7</i>	<i>60.6</i>	<i>61.0</i>	<i>5.3</i>	<i>19.5</i>	<i>17.8</i>	<i>10.8</i>	<i>10.5</i>	<i>0.4</i>	<i>2.8</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0	4.5	4.8	5.5	0.0	0.2
Tillman 80 MGD	1.2	6.3	0.5	0.0	0.0	0.2	1.1	0.0	0.0	0.0
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.8	6.9	0.5	0.0	0.0	0.1	1.2	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>29.2</i>	<i>39.8</i>	<i>32.3</i>	<i>0.1</i>	<i>1.1</i>	<i>4.9</i>	<i>7.2</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>140.3</i>	<i>74.8</i>	<i>74.7</i>	<i>3.5</i>	<i>23.3</i>	<i>25.2</i>	<i>13.6</i>	<i>13.3</i>	<i>0.6</i>	<i>4.2</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0	4.5	4.8	5.5	0.0	0.2
Tillman 100 MGD	1.4	13.1	0.5	0.0	0.0	0.2	2.4	0.0	0.0	0.0
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>28.6</i>	<i>40.6</i>	<i>33.8</i>	<i>3.1</i>	<i>5.0</i>	<i>4.9</i>	<i>7.2</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>130.9</i>	<i>72.9</i>	<i>72.9</i>	<i>6.2</i>	<i>25.5</i>	<i>23.5</i>	<i>13.1</i>	<i>12.7</i>	<i>0.6</i>	<i>3.9</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	25.1	26.3	30.4	0.1	1.0	4.5	4.8	5.5	0.0	0.2
Tillman 100 MGD	1.4	13.1	0.5	0.0	0.0	0.2	2.4	0.0	0.0	0.0
Tillman Process Upgrades	1.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	-	1.0	2.0	3.0	4.0	-	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>28.6</i>	<i>40.6</i>	<i>33.8</i>	<i>3.1</i>	<i>5.0</i>	<i>4.9</i>	<i>7.2</i>	<i>5.5</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>130.9</i>	<i>72.9</i>	<i>72.9</i>	<i>6.2</i>	<i>25.5</i>	<i>23.54</i>	<i>13.08</i>	<i>12.66</i>	<i>0.61</i>	<i>3.94</i>

**OPERATIONAL EMISSIONS SUMMARY (2020)**

**MOBILE SOURCE EMISSIONS (2020)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary	20.5	3.3	23.6	0.1	0.9
Hyperion Process Upgrades	20.5	3.3	23.6	0.1	0.9
Tillman 100 MGD	1.1	0.1	0.4	0.0	0.0
Tillman 80 MGD	1.0	0.1	0.4	0.0	0.0
Tillman Process	0.8	0.1	0.4	0.0	0.0
Tillman Storage	0.3	0.0	0.3	0.0	0.0
LAG 30 MGD	0.7	0.1	0.4	0.0	0.0
LAG Storage	0.3	0.0	0.3	0.0	0.0
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.3	0.0	0.0	0.0	0.0
VSLIS	0.3	0.0	0.0	0.0	0.0
<b>Pounds per Month</b>					
Hyperion Full Secondary	617.3	94.9	685.6	3.5	25.6
Hyperion Process Upgrades	617.1	94.8	685.2	3.5	25.6
Tillman 100 MGD	25.6	3.0	2.5	0.1	0.6
Tillman 80 MGD	21.3	2.5	2.1	0.1	0.5
Tillman Process	17.1	2.0	1.8	0.0	0.4
Tillman Storage	0.3	0.0	0.3	0.0	0.0
LAG 30 MGD	12.9	1.5	1.4	0.0	0.3
LAG Storage	0.3	0.0	0.3	0.0	0.0
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.3	0.0	0.0	0.0	0.0
VSLIS	0.3	0.0	0.0	0.0	0.0
<b>Tons Per Year</b>					
Hyperion Full Secondary	3.7	0.6	4.1	0.0	0.2
Hyperion Process Upgrades	3.7	0.6	4.1	0.0	0.2
Tillman 100 MGD	0.2	0.0	0.0	0.0	0.0
Tillman 80 MGD	0.1	0.0	0.0	0.0	0.0
Tillman Process	0.1	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.1	0.0	0.0	0.0	0.0
LAG Storage	0.0	0.0	0.0	0.0	0.0
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.0	0.0	0.0	0.0	0.0
VSLIS	0.0	0.0	0.0	0.0	0.0

**OPERATIONAL EMISSIONS SUMMARY (2020)**

**STATIONARY SOURCE EMISSIONS - PLANT OPERATIONS (2020)**

	CO	VOC	NOX	SOX	PM10
<b>Pounds per Day</b>					
Hyperion Full Secondary		32.7			
Hyperion Process Upgrades		22.6			
Tillman 100 MGD		12.9			
Tillman 80 MGD		6.2			
Tillman Process					
Tillman Storage					
LAG 30 MGD		6.8			
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					
<b>Tons Per Year</b>					
Hyperion Full Secondary		6.0			
Hyperion Process Upgrades		4.1			
Tillman 100 MGD		2.4			
Tillman 80 MGD		1.1			
Tillman Process					
Tillman Storage					
LAG 30 MGD		1.2			
LAG Storage					
NEISII Alignment 1					
NEIS II Alignment 2					
GBIS Alignment 1					
GBIS Alignment 2					
VSLIS					

**OPERATIONAL EMISSIONS SUMMARY (2020)**

**TOTAL MOBILE & STATIONARY EMISSIONS (2020)**

	<b>CO</b>	<b>ROG</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>Pounds per Day</b>					
Hyperion Full Secondary	20.5	36.0	23.6	0.1	0.9
Hyperion Process Upgrades	20.5	25.8	23.6	0.1	0.9
Tillman 100 MGD	1.1	13.0	0.4	0.0	0.0
Tillman 80 MGD	1.0	6.3	0.4	0.0	0.0
Tillman Process	0.8	0.1	0.4	0.0	0.0
Tillman Storage	0.3	0.0	0.3	0.0	0.0
LAG 30 MGD	0.7	6.8	0.4	0.0	0.0
LAG Storage	0.3	0.0	0.3	0.0	0.0
NEISII Alignment 1	0.3	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.3	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.3	0.0	0.0	0.0	0.0
VSLIS	0.3	0.0	0.0	0.0	0.0
<b>Tons Per Year</b>					
Hyperion Full Secondary	3.7	6.5	4.1	0.0	0.2
Hyperion Process Upgrades	3.7	4.7	4.1	0.0	0.2
Tillman 100 MGD	0.2	2.4	0.0	0.0	0.0
Tillman 80 MGD	0.1	1.1	0.0	0.0	0.0
Tillman Process	0.1	0.0	0.0	0.0	0.0
Tillman Storage	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.1	1.2	0.0	0.0	0.0
LAG Storage	0.0	0.0	0.0	0.0	0.0
NEISII Alignment 1	0.0	0.0	0.0	0.0	0.0
NEIS II Alignment 2	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 1	0.0	0.0	0.0	0.0	0.0
GBIS Alignment 2	0.0	0.0	0.0	0.0	0.0
VSLIS	0.0	0.0	0.0	0.0	0.0

**Operational Emissions by Alternatives (2020)**

**Alternative 1**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Full Expansion	20.5	36.0	23.6	0.1	0.9	3.7	6.5	4.1	0.0	0.2
Tillman Process Upgrades	0.8	0.1	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>22.4</i>	<i>36.3</i>	<i>24.7</i>	<i>0.1</i>	<i>0.9</i>	<i>3.8</i>	<i>6.6</i>	<i>4.1</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>107.4</i>	<i>63.0</i>	<i>57.1</i>	<i>2.7</i>	<i>17.9</i>	<i>19.3</i>	<i>11.4</i>	<i>10.1</i>	<i>0.5</i>	<i>3.3</i>

**Alternative 2**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	20.5	25.8	23.6	0.1	0.9	3.7	4.7	4.1	0.0	0.2
Tillman 80 MGD	1.0	6.3	0.4	0.0	0.0	0.1	1.1	0.0	0.0	0.0
Tillman Process Upgrades	0.8	0.1	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG 30 MGD	0.7	6.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>23.8</i>	<i>39.2</i>	<i>25.1</i>	<i>0.1</i>	<i>1.0</i>	<i>3.9</i>	<i>5.8</i>	<i>4.1</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>155.0</i>	<i>80.6</i>	<i>75.2</i>	<i>4.1</i>	<i>27.2</i>	<i>27.9</i>	<i>13.4</i>	<i>13.3</i>	<i>0.7</i>	<i>4.9</i>

**Alternative 3**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	20.5	25.8	23.6	0.1	0.9	3.7	4.7	4.1	0.0	0.2
Tillman 100 MGD	1.1	13.0	0.4	0.0	0.0	0.2	2.4	0.0	0.0	0.0
Tillman Process Upgrades	0.8	0.1	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>23.5</i>	<i>39.1</i>	<i>25.0</i>	<i>0.1</i>	<i>1.0</i>	<i>4.0</i>	<i>7.1</i>	<i>4.1</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>136.9</i>	<i>74.8</i>	<i>68.3</i>	<i>3.6</i>	<i>23.6</i>	<i>24.6</i>	<i>13.6</i>	<i>12.0</i>	<i>0.6</i>	<i>4.3</i>

**Alternative 4**

	Pounds Per Day					Tons Per Year				
	CO	VOC	NOx	SOx	PM10	CO	VOC	NOx	SOx	PM10
Hyperion Process Upgrades	20.5	25.8	23.6	0.1	0.9	3.7	4.7	4.1	0.0	0.2
Tillman 100 MGD	1.1	13.0	0.4	0.0	0.0	0.2	2.4	0.0	0.0	0.0
Tillman Process Upgrades	0.8	0.1	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Tillman Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAG Operational Storage	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NEIS II	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBIS	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total (w/o electricity consumption)</i>	<i>23.5</i>	<i>39.1</i>	<i>25.0</i>	<i>0.1</i>	<i>1.0</i>	<i>4.0</i>	<i>7.1</i>	<i>4.1</i>	<i>0.0</i>	<i>0.2</i>
<i>Total (w/ electricity consumption)</i>	<i>146.3</i>	<i>77.8</i>	<i>71.9</i>	<i>3.9</i>	<i>25.5</i>	<i>26.36</i>	<i>14.13</i>	<i>12.69</i>	<i>0.70</i>	<i>4.64</i>

**ANNUAL EMISSIONS SUMMARY - CONSTRUCTION & OPERATIONAL EMISSIONS  
- TONS PER YEAR**

**Alternative 1**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>2010</b>					
Construction Emissions	404	53	247	21	43
Operational Emissions	4	2	3	0	1
<i>Total</i>	<i>408</i>	<i>55</i>	<i>251</i>	<i>21</i>	<i>43</i>
<b>2011</b>					
Construction Emissions	621	84	408	38	52
Operational Emissions	5	3	4	0	1
<i>Total</i>	<i>626</i>	<i>87</i>	<i>412</i>	<i>38</i>	<i>53</i>
<b>2012</b>					
Construction Emissions	465	63	301	29	32
Operational Emissions	18	9	11	0	3
<i>Total</i>	<i>483</i>	<i>71</i>	<i>312</i>	<i>30</i>	<i>35</i>
<b>2013</b>					
Construction Emissions	335	45	215	21	22
Operational Emissions	18	10	12	0	3
<i>Total</i>	<i>353</i>	<i>55</i>	<i>227</i>	<i>22</i>	<i>25</i>
<b>2014</b>					
Construction Emissions	336	45	222	22	26
Operational Emissions	19	11	12	0	3
<i>Total</i>	<i>355</i>	<i>56</i>	<i>234</i>	<i>22</i>	<i>28</i>
<b>2015</b>					
Construction Emissions	35	5	26	2	8
Operational Emissions	19	11	12	0	3
<i>Total</i>	<i>53</i>	<i>16</i>	<i>38</i>	<i>3</i>	<i>10</i>
<b>2016</b>					
Construction Emissions	35	5	26	2	8
Operational Emissions	19	11	12	0	3
<i>Total</i>	<i>53</i>	<i>16</i>	<i>38</i>	<i>3</i>	<i>10</i>
<b>2017</b>					
Construction Emissions	131	16	55	4	10
Operational Emissions	18	11	11	0	3
<i>Total</i>	<i>149</i>	<i>27</i>	<i>65</i>	<i>4</i>	<i>13</i>
<b>2018</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	18	11	11	0	3
<i>Total</i>	<i>148</i>	<i>27</i>	<i>63</i>	<i>4</i>	<i>12</i>
<b>2019</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	18	11	11	0	3
<i>Total</i>	<i>148</i>	<i>27</i>	<i>63</i>	<i>4</i>	<i>12</i>
<b>2020</b>					
Construction Emissions	39	5	11	1	1
Operational Emissions	19	11	10	0	3
<i>Total</i>	<i>59</i>	<i>16</i>	<i>21</i>	<i>2</i>	<i>4</i>
<b>MAX</b>	<b>626</b>	<b>87</b>	<b>412</b>	<b>38</b>	<b>53</b>

**ANNUAL EMISSIONS SUMMARY - CONSTRUCTION & OPERATIONAL EMISSIONS  
- TONS PER YEAR**

**Alternative 2**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>2010</b>					
Construction Emissions	404	53	247	21	43
Operational Emissions	4	2	4	0	0
<i>Total</i>	<i>408</i>	<i>55</i>	<i>251</i>	<i>21</i>	<i>43</i>
<b>2011</b>					
Construction Emissions	621	84	408	38	52
Operational Emissions	6	3	6	0	1
<i>Total</i>	<i>627</i>	<i>87</i>	<i>414</i>	<i>38</i>	<i>53</i>
<b>2012</b>					
Construction Emissions	523	71	352	32	46
Operational Emissions	11	6	10	0	1
<i>Total</i>	<i>535</i>	<i>77</i>	<i>362</i>	<i>33</i>	<i>48</i>
<b>2013</b>					
Construction Emissions	492	67	328	29	50
Operational Emissions	16	8	12	0	2
<i>Total</i>	<i>508</i>	<i>75</i>	<i>340</i>	<i>29</i>	<i>52</i>
<b>2014</b>					
Construction Emissions	445	62	308	32	50
Operational Emissions	21	11	13	0	3
<i>Total</i>	<i>466</i>	<i>72</i>	<i>321</i>	<i>32</i>	<i>53</i>
<b>2015</b>					
Construction Emissions	35	5	26	2	8
Operational Emissions	26	14	14	1	4
<i>Total</i>	<i>61</i>	<i>19</i>	<i>40</i>	<i>3</i>	<i>12</i>
<b>2016</b>					
Construction Emissions	35	5	26	2	8
Operational Emissions	26	14	14	1	4
<i>Total</i>	<i>61</i>	<i>19</i>	<i>40</i>	<i>3</i>	<i>12</i>
<b>2017</b>					
Construction Emissions	131	16	55	4	10
Operational Emissions	25	14	13	1	4
<i>Total</i>	<i>156</i>	<i>30</i>	<i>68</i>	<i>5</i>	<i>14</i>
<b>2018</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	25	14	13	1	4
<i>Total</i>	<i>155</i>	<i>30</i>	<i>65</i>	<i>4</i>	<i>13</i>
<b>2019</b>					
Construction Emissions	104	13	37	3	5
Operational Emissions	25	14	13	1	4
<i>Total</i>	<i>129</i>	<i>26</i>	<i>51</i>	<i>3</i>	<i>10</i>
<b>2020</b>					
Construction Emissions	39	5	11	1	1
Operational Emissions	28	13	13	1	5
<i>Total</i>	<i>67</i>	<i>18</i>	<i>25</i>	<i>2</i>	<i>6</i>
<b>MAX</b>	<b>627</b>	<b>87</b>	<b>414</b>	<b>38</b>	<b>53</b>

**ANNUAL EMISSIONS SUMMARY - CONSTRUCTION & OPERATIONAL EMISSIONS  
- TONS PER YEAR**

**Alternative 3**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>2010</b>					
Construction Emissions	418	55	256	22	44
Operational Emissions	4	2	4	0	0
<i>Total</i>	422	57	260	22	45
<b>2011</b>					
Construction Emissions	599	81	394	37	93
Operational Emissions	6	3	6	0	1
<i>Total</i>	605	84	400	37	94
<b>2012</b>					
Construction Emissions	475	64	315	30	40
Operational Emissions	11	6	10	0	1
<i>Total</i>	486	71	325	30	41
<b>2013</b>					
Construction Emissions	383	52	244	23	31
Operational Emissions	11	6	10	0	1
<i>Total</i>	394	58	254	23	32
<b>2014</b>					
Construction Emissions	716	95	419	37	64
Operational Emissions	21	11	13	0	3
<i>Total</i>	737	106	432	37	68
<b>2015</b>					
Construction Emissions	188	25	104	8	22
Operational Emissions	21	11	12	0	3
<i>Total</i>	209	36	116	9	25
<b>2016</b>					
Construction Emissions	231	29	100	8	17
Operational Emissions	21	11	12	0	3
<i>Total</i>	252	40	112	8	20
<b>2017</b>					
Construction Emissions	131	16	55	4	10
Operational Emissions	24	13	13	1	4
<i>Total</i>	155	29	68	5	14
<b>2018</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	24	13	13	1	4
<i>Total</i>	153	29	65	4	13
<b>2019</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	24	13	13	1	4
<i>Total</i>	153	29	65	4	13
<b>2020</b>					
Construction Emissions	39	5	11	1	1
Operational Emissions	25	14	12	1	4
<i>Total</i>	64	18	23	2	5
<b>MAX</b>	<b>737</b>	<b>106</b>	<b>432</b>	<b>37</b>	<b>94</b>

**ANNUAL EMISSIONS SUMMARY - CONSTRUCTION & OPERATIONAL EMISSIONS  
- TONS PER YEAR**

**Alternative 4**

	<b>CO</b>	<b>VOC</b>	<b>NOX</b>	<b>SOX</b>	<b>PM10</b>
<b>2010</b>					
Construction Emissions	418	55	256	22	44
Operational Emissions	4	2	4	0	0
<i>Total</i>	422	57	260	22	45
<b>2011</b>					
Construction Emissions	599	81	394	37	93
Operational Emissions	6	3	6	0	1
<i>Total</i>	604	84	400	37	94
<b>2012</b>					
Construction Emissions	475	64	315	30	40
Operational Emissions	11	6	10	0	1
<i>Total</i>	486	71	325	30	41
<b>2013</b>					
Construction Emissions	383	52	244	23	31
Operational Emissions	11	6	10	0	1
<i>Total</i>	394	58	254	23	32
<b>2014</b>					
Construction Emissions	716	95	419	37	64
Operational Emissions	21	11	13	0	3
<i>Total</i>	737	106	432	37	68
<b>2015</b>					
Construction Emissions	188	25	104	8	22
Operational Emissions	21	11	12	0	3
<i>Total</i>	209	36	116	9	25
<b>2016</b>					
Construction Emissions	231	29	100	8	17
Operational Emissions	21	11	12	0	3
<i>Total</i>	252	40	112	8	20
<b>2017</b>					
Construction Emissions	131	16	55	4	10
Operational Emissions	24	13	13	1	4
<i>Total</i>	155	29	68	5	14
<b>2018</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	24	13	13	1	4
<i>Total</i>	153	29	65	4	13
<b>2019</b>					
Construction Emissions	130	16	52	4	9
Operational Emissions	24	13	13	1	4
<i>Total</i>	153	29	65	4	13
<b>2020</b>					
Construction Emissions	39	5	11	1	1
Operational Emissions	26	14	13	1	5
<i>Total</i>	66	19	24	2	6
<b>MAX</b>	<b>737</b>	<b>106</b>	<b>432</b>	<b>37</b>	<b>94</b>