

PG&E PIPELINE MAINTENANCE PROJECTS – R-354, R-519 AND RT-102
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 1: CONSTRUCTION EMISSIONS SUMMARY

Source	Peak Day Emissions, lbs/day										Annual Emissions, tons/yr											
	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	MTCO ₂ e	
R-354 - Line 137B Fresh Water Slough Crossing Decommissioning	35.98	1.91	1.44	0.72	1.03	37.78	0.13	1.08	1.38	13,160	0.041	0.005	0.002	0.001	0.002	0.143	0.0004	0.001	0.008	37.0	34.1	
R-519 - Line 137C Ryan Slough Crossing Replacement and Decommissioning	24.90	1.85	0.89	0.52	0.88	54.18	0.13	0.63	1.71	12,964	0.071	0.011	0.003	0.002	0.004	0.433	0.001	0.002	0.021	88.2	81.0	
RT-102 - Line 177A Ryan Creek Exposure Remediation	11.17	0.75	0.46	0.21	0.30	19.33	0.06	0.34	1.28	6,149	0.036	0.007	0.002	0.001	0.002	0.231	0.001	0.001	0.016	56.1	51.5	
Average Peak Pounds/Day	24.02	1.50	0.93	0.49	0.74	37.10	0.10	0.68	1.46	10,758	-	-	-	-	-	-	-	-	-	-	-	
Peak Day within NCUAQMD	35.98	1.91	1.44	0.72	1.03	54.18	0.13	1.08	1.71	13,160	-	-	-	-	-	-	-	-	-	-	-	
Total Annual Emissions within NCUAQMD	-	-	-	-	-	-	-	-	-	-	0.148	0.022	0.007	0.004	0.007	0.807	0.002	0.004	0.045	181.3	166.6	
GHG - MTCO₂e conversions																			298	25	1	-
Total MTCO₂e, tons/yr																			166.6			

Notes:

- EPA Emission Factors for Greenhouse Gas Inventories (298 for N₂O, 25 for CH₄, and 1 for CO₂, April 2014, Table 9- Global Warming Potentials (GWPs) - http://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

NCUAQMD - North Coast Unified Air Quality Management District

NO_x - Oxides of Nitrogen

ROG - Reactive Organic Gases

PM_{2.5} - Particulate Matter 2.5 Microns or Less

PM₁₀ - Particulate Matter 10 Microns or Less

DPM - Diesel Particulate Matter

CO - carbon monoxide

SO₂ - Sulfur Dioxide

N₂O - Nitrous Oxide

CH₄ - Methane

CO₂ - Carbon Dioxide

PG&E PIPELINE MAINTENANCE PROJECTS – R-354, R-519 AND RT-102
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 2: R-354 – LINE 137B FRESHWATER SLOUGH CROSSING DECOMMISSIONING

On-Site Sources

Source	BHP	Load Factor	Number	Hours/Day	Duration (days)	Emission Factors (g/bhp-hr)										Emissions (lb/day)										Total Emissions (tons)									
						NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Cement Pump	85	74	1	12	2	0.260	0.060	0.008	0.008	0.018	3.700	0.006	0.004	0.055	568	0.43	0.100	0.013	0.013	0.030	6.157	0.010	0.007	0.092	946	0.000	0.000	0.000	0.000	0.000	0.006	0.0000	0.0000	0.000	0.946
Crane	220	29	1	12	10	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.153	507	0.44	0.101	0.014	0.014	0.030	3.713	0.008	0.007	0.258	856	0.002	0.001	0.000	0.000	0.019	0.0000	0.0000	0.001	4.280	
Diving Spread	90	48	1	12	5	0.260	0.060	0.008	0.008	0.018	3.700	0.006	0.004	0.067	568	0.30	0.069	0.009	0.009	0.021	4.229	0.007	0.005	0.077	649	0.001	0.000	0.000	0.000	0.011	0.0000	0.0000	0.000	1.624	
Excavator	310	38	1	12	23	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.152	504	0.81	0.187	0.025	0.025	0.056	6.856	0.016	0.013	0.474	1572	0.009	0.002	0.000	0.000	0.079	0.0002	0.0002	0.005	18.073	
Flushing Pump	17	74	1	12	2	4.803	0.855	0.255	0.255	0.778	2.604	0.007	0.004	0.077	568	1.60	0.285	0.085	0.085	0.259	0.867	0.002	0.001	0.026	189	0.002	0.000	0.000	0.000	0.001	0.0000	0.0000	0.000	0.189	
Vacuum Truck System	225	48	1	12	2	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.047	568	0.74	0.171	0.023	0.023	0.051	6.286	0.014	0.012	0.134	1624	0.001	0.000	0.000	0.000	0.006	0.0000	0.0000	0.000	1.624	
Wheel Loader	150	36	1	12	4	0.260	0.060	0.008	0.008	0.018	3.700	0.005	0.004	0.152	505	0.37	0.086	0.011	0.011	0.026	5.286	0.007	0.006	0.217	722	0.001	0.000	0.000	0.000	0.011	0.0000	0.0000	0.000	1.443	
Total						4.69	0.998	0.180	0.180	0.473	33.39	0.065	0.051	1.277	6557	0.016	0.004	0.001	0.001	0.001	0.132	0.0003	0.0002	0.008	28.18										

On-Road Sources

Source	Peak Round Trips/Day	Average Round Trips/Day	Number of Vehicles	Length of Round Trip (miles)	Duration (days)	Emission Factors (g/mile)										Peak Day Emissions (lb/day)										Total Emissions (tons)									
						NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Passenger Vehicle - LDA	1	1	8	25	23	0.203	0.048	0.0475	0.0019	0.0000	1.415	0.003	0.013	0.010	329	0.090	0.021	0.021	0.001	0.000	0.624	0.001	0.006	0.004	144.9	0.001	0.000	0.000	0.000	0.007	0.0000	0.000	0.0001	1.666	
Light-Duty Truck - LDT2 (offsite)	1	1	8	25	23	0.128	0.030	0.1255	0.0215	0.0225	0.174	0.003	0.056	0.001	411	0.057	0.013	0.055	0.009	0.010	0.077	0.001	0.025	0.001	181.1	0.001	0.000	0.001	0.000	0.001	0.0000	0.000	0.0000	2.083	
Passenger Vehicle - LDA	1	1	5	25	5	0.203	0.048	0.0475	0.0019	0.0000	1.415	0.003	0.013	0.010	329	0.056	0.013	0.013	0.001	0.000	0.390	0.001	0.004	0.003	90.5	0.000	0.000	0.000	0.000	0.001	0.0000	0.000	0.0000	0.226	
Light-Duty Truck - LDT2 (offsite)	1	1	5	25	5	0.128	0.030	0.1255	0.0215	0.0225	0.174	0.003	0.056	0.001	411	0.035	0.008	0.035	0.006	0.006	0.048	0.001	0.015	0.000	113.2	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.283	
Med-Heavy Duty - T6 Utility (offsite)	1	1	1	40	4	1.640	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	13.55	0.370	0.488	0.216	0.225	1.371	0.025	0.423	0.044	2634	0.007	0.000	0.000	0.000	0.001	0.0000	0.000	0.0000	1.32	
Heavy Duty Haul Truck - T7T (offsite)	1	1	4	160	2	7.684	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	10.84	0.296	0.391	0.173	0.180	1.097	0.020	0.339	0.035	2107	0.011	0.000	0.000	0.000	0.001	0.0000	0.000	0.0000	2.11	
Heavy Duty Haul Truck - T7T (offsite)	1	1	2	40	3	7.684	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	1.36	0.037	0.049	0.022	0.023	0.137	0.003	0.042	0.004	263	0.002	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.40	
Heavy Duty Truck - T7TC (onsite)	1	1	1	0.5	2	16.258	1.677	0.4236	0.2627	0.275	3.983	0.025	0.413	0.099	2568	0.02	0.002	0.000	0.000	0.000	0.004	0.000	0.000	0.000	2.83	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.00	
Heavy Duty Truck - T7TC (offsite)	1	1	1	40	2	8.087	0.236	0.2562	0.1732	0.1810	0.995	0.015	0.245	0.016	1531	0.713	0.021	0.023	0.015	0.016	0.088	0.001	0.022	0.001	135	0.001	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.135	
Heavy Duty Truck - T7TC (offsite)	1	1	5	40	1	8.087	0.236	0.2562	0.1732	0.1810	0.995	0.015	0.245	0.016	1531	3.566	0.104	0.113	0.076	0.080	0.439	0.006	0.108	0.007	675	0.002	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.337	
Heavy Duty Truck - T7TC (offsite)	1	1	2	24	1	8.087	0.236	0.2562	0.1732	0.1810	0.995	0.015	0.245	0.016	1531	0.856	0.025	0.027	0.018	0.019	0.105	0.002	0.026	0.002	162	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.081	
Total						31.28	0.911	1.229	0.537	0.560	4.385	0.063	1.024	0.102	6603	0.025	0.001	0.002	0.001	0.001	0.012	0.0001	0.001	0.0001	8.821										

Notes:

- Hours per day and durations provided by Project Applicant.
- Round trips for LDA and LDT2 is estimated from Eureka Area (25-miles).
- Estimated trucks to transport rental equipment from within the North Coast Unified Air Quality Management District, 160 mile round trip.
- Estimated trucks to transport of backfill material, waste and recycling to local facilities, 40 mile round trip.
- Estimated trucks to transport concrete from Eureka Ready Mix Arcata Batch Plant , 24 mile round trip.

**PG&E PIPELINE MAINTENANCE PROJECTS – R-354, R-519 AND RT-102
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 3: R-519 – LINE 137C RYAN SLOUGH CROSSING REPLACEMENT**

On-Site Sources

Source	BHP	Load Factor	Number	Hours/Day	Duration (days)	Emission Factors (g/bhp-hr)										Emissions (lb/day)										Total Emissions (tons)									
						NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Cement Pump	85	74	1	12	2	0.260	0.060	0.008	0.008	0.018	3.700	0.006	0.004	0.055	568	0.43	0.100	0.013	0.013	0.030	6.157	0.010	0.007	0.092	946	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.946	
Crane	220	29	1	12	30	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.153	507	0.44	0.101	0.014	0.014	0.030	3.713	0.008	0.007	0.258	856	0.007	0.002	0.000	0.000	0.056	0.000	0.000	0.004	12.840	
Diving Spread	90	48	1	12	4	0.260	0.060	0.008	0.008	0.018	3.700	0.006	0.004	0.067	568	0.30	0.069	0.009	0.009	0.021	4.229	0.007	0.005	0.077	649	0.001	0.000	0.000	0.000	0.008	0.000	0.000	0.000	1.299	
Excavator	310	38	1	12	45	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.152	504	0.81	0.187	0.025	0.025	0.056	6.856	0.016	0.013	0.474	1572	0.018	0.004	0.001	0.001	0.154	0.000	0.000	0.011	35.361	
Flushing Pump	17	74	1	12	2	4.803	0.855	0.255	0.255	0.778	2.604	0.007	0.004	0.077	568	1.60	0.285	0.085	0.085	0.259	0.867	0.002	0.001	0.026	189	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.189	
Pilot Tube Spread	50	48	1	12	2	2.740	0.120	0.008	0.008	0.018	3.700	0.007	0.004	0.150	568	1.74	0.076	0.005	0.005	0.011	2.349	0.004	0.003	0.095	361	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.361	
Vacuum Excavator System	310	48	1	12	8	0.260	0.060	0.008	0.008	0.018	3.700	0.005	0.004	0.067	568	1.02	0.236	0.031	0.031	0.071	14.565	0.020	0.017	0.264	2237	0.004	0.001	0.000	0.000	0.058	0.000	0.000	0.001	8.949	
Vacuum Truck System	225	48	1	12	2	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.047	568	0.74	0.171	0.023	0.023	0.051	6.286	0.014	0.012	0.134	1624	0.001	0.000	0.000	0.000	0.006	0.000	0.000	0.000	1.624	
Welding Machine	25	45	1	12	14	2.750	0.120	0.008	0.008	0.018	4.100	0.007	0.004	0.077	568	0.82	0.036	0.002	0.002	0.005	1.220	0.002	0.001	0.023	169	0.006	0.000	0.000	0.000	0.009	0.000	0.000	0.000	1.184	
Wheel Loader	150	36	1	12	45	0.260	0.060	0.008	0.008	0.018	3.700	0.005	0.004	0.152	505	0.37	0.086	0.011	0.011	0.026	5.286	0.007	0.006	0.217	722	0.008	0.002	0.000	0.000	0.119	0.000	0.000	0.005	16.236	
Total						8.27	1.346	0.219	0.219	0.560	51.53	0.091	0.072	1.659	9324	0.048	0.010	0.001	0.001	0.003	0.420	0.001	0.001	0.001	0.003	0.420	0.001	0.001	0.001	0.021	78.99				

On-Road Sources

Source	Peak Round Trips/Day	Average Round Trips/Day	Number of Vehicles	Length of Round Trip (miles)	Duration (days)	Emission Factors (g/mile)										Peak Day Emissions (lb/day)										Total Emissions (tons)									
						NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Passenger Vehicle - LDA	1	1	5	25	45	0.203	0.048	0.0475	0.0019	0.0000	1.415	0.003	0.013	0.010	329	0.056	0.013	0.013	0.001	0.000	0.390	0.001	0.004	0.003	90.5	0.001	0.000	0.000	0.000	0.009	0.0000	0.000	0.0001	2.037	
Light-Duty Truck - LDT2 (offsite)	1	1	5	25	45	0.128	0.030	0.1255	0.0215	0.0225	0.174	0.003	0.056	0.001	411	0.035	0.008	0.035	0.006	0.006	0.048	0.001	0.015	0.000	113.2	0.001	0.000	0.001	0.000	0.001	0.0000	0.000	0.0000	2.547	
Passenger Vehicle - LDA	1	1	5	25	4	0.203	0.048	0.0475	0.0019	0.0000	1.415	0.003	0.013	0.010	329	0.056	0.013	0.013	0.001	0.000	0.390	0.001	0.004	0.003	90.5	0.000	0.000	0.000	0.000	0.001	0.0000	0.000	0.0000	0.181	
Light-Duty Truck - LDT2 (offsite)	1	1	5	25	4	0.128	0.030	0.1255	0.0215	0.0225	0.174	0.003	0.056	0.001	411	0.035	0.008	0.035	0.006	0.006	0.048	0.001	0.015	0.000	113.2	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.226	
Med-Heavy Duty - T6 Utility (offsite)	1	1	1	40	8	1.640	0.014	0.1578	0.0084	0.009	0.053	0.010	0.162	0.001	1060	0.145	0.001	0.014	0.001	0.001	0.005	0.001	0.014	0.000	93.5	0.001	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.374	
Heavy Duty Haul Truck - T7T (offsite)	1	1	4	160	2	7.684	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	10.84	0.296	0.391	0.173	0.180	1.097	0.020	0.339	0.035	2107	0.011	0.000	0.000	0.000	0.001	0.0000	0.000	0.0000	2.11	
Heavy Duty Truck - T7TC (onsite)	1	1	2	0.5	10	16.258	1.677	0.4236	0.2627	0.275	3.983	0.025	0.413	0.099	2568	0.04	0.004	0.001	0.001	0.001	0.009	0.000	0.001	0.000	5.66	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.03	
Heavy Duty Truck - T7TC (offsite)	1	1	2	40	10	8.087	0.236	0.2562	0.1732	0.1810	0.995	0.015	0.245	0.016	1531	1.426	0.042	0.045	0.031	0.032	0.175	0.003	0.043	0.003	270	0.007	0.000	0.000	0.000	0.001	0.0000	0.000	0.0000	1.350	
Heavy Duty Truck - T7TC (offsite)	1	1	5	40	1	8.087	0.236	0.2562	0.1732	0.1810	0.995	0.015	0.245	0.016	1531	3.566	0.104	0.113	0.076	0.080	0.439	0.006	0.108	0.007	675	0.002	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.337	
Heavy Duty Truck - T7TC (offsite)	1	1	1	24	1	8.087	0.236	0.2562	0.1732	0.1810	0.995	0.015	0.245	0.016	1531	0.428	0.012	0.014	0.009	0.010	0.053	0.001	0.013	0.001	81.0	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.0000	0.040	
Total						16.63	0.502	0.672	0.303	0.315	2.653	0.035	0.556	0.052	3640	0.023	0.001	0.002	0.001	0.001	0.013	0.0001	0.001	0.001	0.013	0.0001	0.001	0.0001	0.001	0.0001	9.229				

Notes:

- Hours per day and durations provided by Project Applicant.
- Round trips for LDA and LDT2 is estimated from Eureka Area (25-miles).
- Estimated trucks to transport rental equipment from within the North Coast Unified Air Quality Management District, 160 mile round trip.
- Estimated trucks to transport of backfill material, waste and recycling to local facilities, 40 mile round trip.
- Estimated trucks to transport concrete from Eureka Ready Mix Arcata Batch Plant , 24 mile round trip.

PG&E PIPELINE MAINTENANCE PROJECTS – R-354, R-519 AND RT-102
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 4: RT-102 - LINE 177A RYAN CREEK EXPOSURE REMEDIATION

On-Site Sources

Source	BHP	Load Factor	Number	Hours/Day	Duration (days)	Emission Factors (g/bhp-hr)										Emissions (lb/day)										Total Emissions (tons)									
						NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Crane	220	29	3	12	25	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.153	507	1.32	0.304	0.041	0.041	0.091	11.140	0.025	0.021	0.775	2568	0.016	0.004	0.001	0.001	0.001	0.139	0.000	0.0003	0.010	32.100
Excavator	310	38	1	12	25	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.004	0.152	504	0.81	0.187	0.025	0.025	0.056	6.856	0.016	0.013	0.474	1572	0.010	0.002	0.000	0.000	0.001	0.086	0.000	0.0002	0.006	19.645
Total															2.13	0.491	0.065	0.065	0.147	18.00	0.041	0.034	1.248	4140	0.027	0.006	0.001	0.001	0.002	0.225	0.001	0.0004	0.016	51.74	

On-Road Sources

Source	Peak Round Trips/Day	Average Round Trips/Day	Number of Vehicles	Length of Round Trip (miles)	Duration (days)	Emission Factors (g/mile)										Peak Day Emissions (lb/day)										Total Emissions (tons)									
						NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Passenger Vehicle - LDA	1	1	5	25	25	0.203	0.048	0.0475	0.0019	0.0000	1.415	0.003	0.013	0.010	329	0.056	0.013	0.013	0.001	0.000	0.390	0.001	0.004	0.003	90.53	0.001	0.000	0.000	0.0000	0.0000	0.005	0.0000	0.000	0.0000	1.132
Light-Duty Truck - LDT2 (offsite)	1	1	5	25	25	0.128	0.030	0.1255	0.0215	0.0225	0.174	0.003	0.056	0.001	411	0.035	0.008	0.035	0.006	0.006	0.048	0.001	0.015	0.000	113.19	0.000	0.000	0.000	0.0001	0.0001	0.001	0.0000	0.000	0.0000	1.415
Med-Heavy Duty - T6 Utility (offsite)	1	1	1	40	4	1.640	0.014	0.1578	0.0084	0.009	0.053	0.010	0.162	0.001	1060	0.145	0.001	0.014	0.001	0.001	0.005	0.001	0.014	0.000	93.48	0.000	0.000	0.000	0.0000	0.0000	0.000	0.0000	0.000	0.0000	0.187
Heavy Duty Haul Truck - T7T (offsite)	1	1	2	160	2	7.684	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	5.42	0.148	0.195	0.086	0.090	0.549	0.010	0.169	0.018	1054	0.005	0.000	0.000	0.0001	0.0001	0.001	0.0000	0.000	0.0000	1.05
Heavy Duty Haul Truck - T7T (offsite)	1	1	2	40	3	7.684	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	1.36	0.037	0.049	0.022	0.023	0.137	0.003	0.042	0.004	263	0.002	0.000	0.000	0.0000	0.0000	0.000	0.0000	0.000	0.0000	0.40
Heavy Duty Haul Truck - T7T (offsite)	1	1	3	40	1	7.684	0.210	0.2768	0.1223	0.128	0.778	0.014	0.240	0.025	1494	2.03	0.055	0.073	0.032	0.034	0.206	0.004	0.063	0.007	395	0.001	0.000	0.000	0.0000	0.0000	0.000	0.0000	0.000	0.0000	0.20
Total															9.04	0.263	0.379	0.147	0.153	1.334	0.019	0.309	0.032	2009	0.010	0.001	0.001	0.0002	0.0002	0.006	0.0000	0.001	0.0001	4.380	

Notes:

- Hours per day and durations provided by Project Applicant.
- Round trips for LDA and LDT2 is estimated from Eureka Area (25-miles).
- Estimated trucks to transport rental equipment from within the North Coast Unified Air Quality Management District, 160 mile round trip.
- Estimated trucks to transport of backfill material, waste and recycling to local facilities, 40 mile round trip.
- Estimated trucks to transport concrete from Eureka Ready Mix Arcata Batch Plant , 24 mile round trip.

PG&E PIPELINE MAINTENANCE PROJECTS – R-354, R-519 AND RT-102
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 5: CONSTRUCTION ACTIVITY - FUGITIVE DUST EMISSIONS

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Peak Day Emissions (lbs/day)		Total Emissions (tons)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
R-354 - Line 137B Excavation Activities	0.022	acres/day	23	0.429	lbs PM10/day/acre	0.0093	0.0008	0.00011	0.00001
R-354 - Line 137B Truck Loading Activities	100	tons/day	1	1.72E-04	lbs/ton	0.0172	0.0026	0.0000	0.0000
R-519 - Line 137C Excavation Activities	0.001	acres/day	45	0.429	lbs PM10/day/acre	0.0003	0.0000	0.00001	0.00000
R-519 - Line 137C Truck Loading Activities	100	tons/day	1	1.72E-04	lbs/ton	0.0172	0.0026	0.0000	0.0000
RT-102 - Line 177A Excavation Activities	0.004	acres/day	25	0.429	lbs PM10/day/acre	0.0015	0.0001	0.00002	0.00000
RT-102 - Line 177A Truck Loading Activities	60	tons/day	1	1.72E-04	lbs/ton	0.0103	0.0016	0.0000	0.0000
Total						0.0559	0.0078	0.0002	0.00002

Fugitive Dust Emissions: Inputs for the Table

Emission factors based on following inputs

Mean number of rain days per year	0	worst case
Silt content of soil, fill storage pile, %	1.5	SCAQMD default value
Roadway inputs (paved and unpaved, as per URBEMIS)		
Roads mean vehicle weight, tons	20.61	based on project description, HHDT + LDT and vehicles weight (average of full and empty)
unpaved dirt road silt content, %	8.4	AP-42 construction sites
Truck Loading inputs		
k, particle size multiplier, default=0.35 for pm10	0.35	
U, mean wind speed, mph range 1.3-15	8.15	
M, moisture content, default=12%	12	
PM2.5/PM10 ratio truck loading	0.15	
Site grading emissions from CalEEMod for grading	0.091	ratio of PM2.5/PM10 CalEEMod
Demolition materials, tons/yds ³	1.000	estimated for concrete debris
Fill materials, tons/yds ³	1.000	estimated for soils
Mitigation: demolition area watering (fraction reduction)	0.61	0.61 for watering every 3 hours (SCAQMD)
Mitigation: grading/dist area watering (fraction reduction)	0.61	0.61 for watering every 3 hours (SCAQMD)
Mitigation: dumping soil moisture (fraction reduction)	0.69	0.69 for minimum 12% soil moisture (SCAQMD)
Mitigation: storage piles (fraction reduction)	0.90	0.90 for watering by hand and covering (SCAQMD)
Mitigation: roads (fraction reduction)	0.55	0.55 for watering 3X per day (SCAQMD), 0.80 for soil binders applied monthly (AP-42)

Notes:

PM2.5/PM10 ratio as per AP-42 k factor for PM10 and PM2.5

Demolition dust calculations as per EPA AP-42 11.19 and 13.2.4

Truck loading dumping cut/fill based on CalEEMod

Storage pile emissions based on SCAQMD Handbook (URBEMIS does not address emissions from storage piles)

Paved and unpaved road dust emissions based on AP-42 2006 (unpaved) Chapt 13. EPA AP-42 2006 is the same as URBEMIS and CalEEMod

One month assumes 22 days of activity, as per URBEMIS

**PG&E PIPELINE MAINTENANCE PROJECTS – R-354, R-519 AND RT-102
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 6: EMISSION FACTORS AND ASSUMPTIONS**

Onsite				Emission Factors, g/bhp-hr										Emission Factors, lb/bhp-hr									
Source	Tier	Operational Horsepower	Load Factor	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Cement Pump	4	85	74	0.260	0.060	0.008	0.008	0.018	3.700	0.006	0.0042	0.055	568	0.0006	0.0001	0.0000	0.0000	0.0000	0.0082	0.00001	0.00001	0.00012	1.2529
Crane	4	220	29	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.0042	0.153	507	0.0006	0.0001	0.0000	0.0000	0.0000	0.0049	0.00001	0.00001	0.00034	1.1181
Diving Spread	4	90	48	0.260	0.060	0.008	0.008	0.018	3.700	0.006	0.0042	0.067	568	0.0006	0.0001	0.0000	0.0000	0.0000	0.0082	0.00001	0.00001	0.00015	1.2529
Excavator	4	310	38	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.0042	0.152	504	0.0006	0.0001	0.0000	0.0000	0.0000	0.0049	0.00001	0.00001	0.00034	1.1118
Flushing Pump	--	17	74	4.803	0.855	0.255	0.255	0.778	2.604	0.007	0.0042	0.077	568	0.0106	0.0019	0.0006	0.0006	0.0017	0.0057	0.00002	0.00001	0.00017	1.2529
Pilot Tube Spread	4	50	48	2.740	0.120	0.008	0.008	0.018	3.700	0.007	0.0042	0.150	568	0.0060	0.0003	0.0000	0.0000	0.0000	0.0082	0.00002	0.00001	0.00033	1.2529
Vacuum Excavator System	4	310	48	0.260	0.060	0.008	0.008	0.018	3.700	0.005	0.0042	0.067	568	0.0006	0.0001	0.0000	0.0000	0.0000	0.0082	0.00001	0.00001	0.00015	1.2529
Vacuum Truck System	4	225	48	0.260	0.060	0.008	0.008	0.018	2.200	0.005	0.0042	0.047	568	0.0006	0.0001	0.0000	0.0000	0.0000	0.0049	0.00001	0.00001	0.00010	1.2529
Welding Machine	4	25	45	2.750	0.120	0.008	0.008	0.018	4.100	0.007	0.0042	0.077	568	0.0061	0.0003	0.0000	0.0000	0.0000	0.0090	0.00002	0.00001	0.00017	1.2529
Wheel Loader	4	150	36	0.260	0.060	0.008	0.008	0.018	3.700	0.005	0.0042	0.152	505	0.0006	0.0001	0.0000	0.0000	0.0000	0.0082	0.00001	0.00001	0.00034	1.1136

Offsite				Emission Factors, g/mile										Emission Factors, lb/mile									
Source	Tier	Region	Speed	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	DPM	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Passenger Vehicle - LDA	N/A	Humboldt County	65	0.203	0.048	0.048	0.002	0.000	1.415	0.003	0.013	0.010	329	0.0004	0.0001	0.0001	0.0000	0.0000	0.0031	0.00001	0.00003	0.00002	0.7243
Light-Duty Truck - LDT2 (onsite)	N/A	Humboldt County	15	0.149	0.132	0.148	0.043	0.045	0.853	0.005	0.091	0.006	666	0.0003	0.0003	0.0003	0.0001	0.0001	0.0019	0.00001	0.00020	0.00001	1.4689
Light-Duty Truck - LDT2 (offsite)	N/A	Humboldt County	65	0.128	0.030	0.125	0.021	0.022	0.174	0.003	0.056	0.001	411	0.0003	0.0001	0.0003	0.0000	0.0000	0.0004	0.00001	0.00012	0.00000	0.9056
Med-Heavy Duty - T6 Utility (onsite)	N/A	Humboldt County	15	4.393	0.162	0.162	0.012	0.013	0.572	0.016	0.272	0.005	1729	0.0097	0.0004	0.0004	0.0000	0.0000	0.0013	0.00004	0.00060	0.00001	3.8127
Med-Heavy Duty - T6 Utility (offsite)	N/A	Humboldt County	65	1.640	0.014	0.158	0.008	0.009	0.053	0.010	0.162	0.001	1060	0.0036	0.0000	0.0003	0.0000	0.0000	0.0001	0.00002	0.00036	0.00000	2.3370
Heavy Duty Haul Truck - T7T (onsite)	N/A	Humboldt County	15	15.286	1.642	0.364	0.269	0.281	4.268	0.025	0.420	0.152	2572	0.0337	0.0036	0.0008	0.0006	0.0006	0.0094	0.00006	0.00093	0.00034	5.6705
Heavy Duty Haul Truck - T7T (offsite)	N/A	Humboldt County	65	7.684	0.210	0.277	0.122	0.128	0.778	0.014	0.240	0.025	1494	0.0169	0.0005	0.0006	0.0003	0.0003	0.0017	0.00003	0.00053	0.00006	3.2928
Heavy Duty Truck - T7TC (onsite)	N/A	Humboldt County	15	16.258	1.677	0.424	0.263	0.275	3.983	0.025	0.413	0.099	2568	0.0358	0.0037	0.0009	0.0006	0.0006	0.0088	0.00005	0.00091	0.00022	5.6613
Heavy Duty Truck - T7TC (offsite)	N/A	Humboldt County	65	8.087	0.236	0.256	0.173	0.181	0.995	0.015	0.245	0.016	1531	0.0178	0.0005	0.0006	0.0004	0.0004	0.0022	0.00003	0.00054	0.00003	3.3744

- Notes:**
- Equipment list and engine size provided by Project Applicant. HP were adjusted whenever data was available for the size of the equipment provided by the applicant.
 - Construction equipment criteria pollutant emission factors and load factors were obtained from CalEEMod, Appendix D 2016.
 - N2O and CH4 emission factors for construction equipment were obtained from CFR Part 98 Table C-2 and CalEEMod Appendix D- Default Data Tables, Table 3.4. Kg/mmbtu was converted to kg/bhp-hr using a diesel energy density of 7000 btu/hp-hr.
 - CO₂ emission factors for construction equipment were obtained from CalEEMod Appendix D- Default Data Tables, Table 3.4.
 - DPM emission factors for construction equipment were obtained from *The Port of Long Beach, 2013 Emissions Inventory Appendix D- Table D-2*.
 - Emission factors for DPM were converted from g/kW-hr to g/bhp-hr by application of the following conversion 1 kw = 1.341 bhp.