Appendix A

Air Quality Emissions Calculations

TABLE A-1

Construction Emissions Summary

Gas Line 131

Construction Emissions With Applicant Proposed Measures (Tier

Construction Year	Criteria Pollutant Emissions[a, b]						Fugitive Dust	
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Average Daily Emissions (lbs/day)	5.05	58.51	44.94	0.16	1.93	1.80	72.66	7.63
Project Emissions (tons/year	0.29	3.31	2.54	0.01	0.11	0.10	4.11	0.43
BAAQMD Thresholds of Significance (lbs/day)[d]	54	N/A	54	N/A	82	54	N/A	N/A
Exceeds Threshold (Y/N)?	N	N	N	N	N	N	N	N

Construction Year	GHG Emissions[a, b]	
	CO_2	CO_2e [e]
Average Daily Emissions (lbs/day)	9,969	10,467
Project Emissions (metric tons/year	823	864
CARB Thresholds of Significance (metric tons/year[f])	N/A	7,000
Exceeds Threshold (Y/N)?	N	N

Notes:

[a] It was assumed that all construction equipment and vehicles used for each construction activity could operate simultaneously on any given day durin

[b] Per APM AQ-2, construction equipment with engines that meet or exceed the Tier 3 emission standards would be used. The following equipment will be Tier 4 emission standards: Welding rig, dozer, and grader.

[c] Implementation of APM AQ-1 was assumed to reduce unpaved road dust from offroad trucks and fugitive dust from earthmoving activities. Reduction

[d] BAAQMD Thresholds of Significance taken from Table 2-1 of the *Draft CEQA Air Quality Guidelines* (BAAQMD 2017).

[e] Only CO_2 emission factors were available for all types of construction equipment utilized for this project. Emissions of methane (CH_4) and nitrous oxide

[f] CARB Thresholds of Significance taken as the statewide interim thresholds of significance for GHGs (CARB, 2008).

1 ton =	2,000	lbs
1 metric ton =	2,204.62	lbs

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
All Projects (R649, R700, R707) - EFS					
BMP Installation	F-150	1	300	8	Gas
	Vermeer Trencher	1	50	8	Diesel
	Ford F-250	2	300-500	8	Diesel
	Ford F-450	1	300-500	8	Diesel
	Ford F-550	1	300-500	8	Diesel
	Dodge 3500	1	385	8	Diesel
	Polaris Razor	1	55	8	Gas
	Boom Knukcle Flat Bed Truck	3	300-500	8	Diesel
Pipe Fabrication Bin Support	Semi with Rocket Launcher	3	400-500	2	Diesel
	F-150	1	300	2	Gas
Pipeline Cleaning Support Lab & Bins	F-150	1	300	2	Gas
	Nissan NV 3500 Van	1	250-400	8	Gas
	Semi with Rocket Launcher	3	400-500	2	Diesel
Waste Off-Haul	Semi with 120BBL Trailer	6	400-500	2	Diesel
	Semi with Rocket Launcher	6	400-500	2	Diesel
	Semi with trailer	1	400-500	8	Diesel
	F-150	1	300	6	Gas
Tank Cleaning	Semi with 120BBL Trailer	1	400-500	8	Diesel
	Pressure Washer	1	10	8	Gas
	F-150	1	300	8	Gas
	F-550	1	397	8	Diesel
Site Restoration	F-150	1	300	8	Gas
	Vermeer Trencher	1	50	8	Diesel
	Ford F-250	2	300-500	8	Diesel
	Ford F-450	1	300-500	8	Diesel
	Ford F-550	1	300-500	8	Diesel
	Dodge 3500	1	385	8	Diesel
	Hydro-Seeder	1	49	8	Diesel
	Polaris Razor	1	55	8	Gas
	Terex Tractor	1	77	8	Diesel
GTGC Scope					
All Projects (R649, R700, R707) - Constructior					
Mobilzation	Excavators	5	204	3	Diesel
	Dozer	2	254	3	Diesel
	Loader	1	232	3	Diesel
	Side Booms	2	307	3	Diesel
	Backhoe	1	130	3	Diesel
	Telehandler	1	142	1	Diesel
	Coating Trucks	2	300	1	Diesel
	Coating Compressor	2	49	0	Diesel
	Welding Trucks	8	260	1	Diesel
	Welding Machines	8	22	0	Diesel
	Crew Trucks	3	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender	1			
	Ozzie Padder	1			
	Water Trucks	4	200	3	Diesel
	Foreman Pickups	4	360	2	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup	1	300	1	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Strip Top Soil North of May School Rd.	Excavators		204		Diesel
	Dozer	1	254	8	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	8	Diesel
	Foreman Pickups	3	360	2	Diesel
	Inspector Pickups	5	325	2	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Grader	1	275	6	Diesel
Strip Top Soil South of May School Rd.	Excavators		204		Diesel
	Dozer	1	254	8	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	8	Diesel
	Foreman Pickups	3	360	2	Diesel
	Inspector Pickups	5	325	2	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Grader	1	275	6	Diesel
	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Set Up Frac Tanks for Strength Tests	Welding Trucks	4	260	1	Diesel
	Welding Machines	4	22	8	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks		200		Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Prep. for Tie-in Clearance	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	2	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	8	Diesel
	Foreman Pickups	3	360	2	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup	1	300	1	Diesel
Weld Clearance	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	8	260	1	Diesel
	Welding Machines	8	22	8	Diesel
	Crew Trucks	2	300	1	Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	1	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
	Flatbed Pickup	1	300	1	Diesel
	CNG Pcikup trucks	4	450	4	Diesel
	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	8	260	1	Diesel
	Welding Machines	8	22	8	Diesel
	Crew Trucks	2	300	1	Diesel
	X-Ray Rig	2	385	1	Diesel
Tie-in	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	1	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup	1	300	1	Diesel
	CNG Pcikup trucks	4	450	4	Diesel
	Excavators	2	204	8	Diesel
	Dozer	2	254	8	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
Complete Right of Way Restoration	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	8	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup	1	300	1	Diesel
	Grader	1	275	5	Diesel
	Excavators	5	204	4	Diesel
	Dozer	2	254	4	Diesel
	Loader	1	232	4	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Complete Demobilization from TCE	Side Booms	2	307	2	Diesel
	Backhoe	1	130	2	Diesel
	Telehandler	1	142	2	Diesel
	Coating Trucks	2	300	2	Diesel
	Coating Compressor	2	49	0	Diesel
	Welding Trucks	8	260	2	Diesel
	Welding Machines	8	22	0	Diesel
	Crew Trucks	2	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	4	Diesel
	Foreman Pickups	3	360	2	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup	1	300	1	Diesel
R649 Project (Southern Section Going to Creek) - Constructi					
Excavate Tie-in Bell Hole @ Portola	Excavators	1	204	8	Diesel
	Dozer	1	254	3	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Fabricate & Install Jump Up @ Portola Ave.	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Install Pipeline from Portola Rd. to R-700 (07+50 - 0+00)	Excavators	1	204	8	Diesel
	Dozer	1	254	4	Diesel
	Loader		232		Diesel
	Side Booms	2	307	4	Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks	1	300	1	Diesel
	Coating Compressor	1	49	8	Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	8	Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder		440		
	Water Trucks	1	200	8	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	2	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Ozzie Padder (OPP-300)	1	440	8	Diesel
	Trencher	1	650	6	Diesel
	Compactor	1	250	4	Diesel
	Dump Trucks	2	350	4	Diesel
Install Pipeline from R-646 towards Hartman Rd. (213+90 - 178+00)	Excavators	1	204	8	Diesel
	Dozer	1	254	4	Diesel
	Loader		232		Diesel
	Side Booms	2	307	4	Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks	1	300	1	Diesel
	Coating Compressor	1	49	8	Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	8	Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder	1	440	8	Diesel
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	2	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Ozzie Padder (OPP-300)	1	440	4	Diesel
	Trencher	1	650	6	Diesel
	Compactor	1	250	4	Diesel
	Dump Trucks	2	350	4	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Excavate Sniff Hole @ Portola Ave.	Excavators	1	204	8	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Prep. Strength Test Southern Section	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Fill 24" Southern Test Portion	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Pioneer Pump	1	415	8	Diesel
Strength Test Southern Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Test Pump	1	350	4	Diesel
	Test Pump Trcuk	1	350	0.25	Diesel
Dewater Southern Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepower**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
	Pioneer Pump	1	415	8	Diesel
Cut off Test Heads & Install L&R's	Excavators	2	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	4	260	1	Diesel
	Welding Machines	4	22	8	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Dry Southern Test Section	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	2	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Dryer	1	300	8	Diesel
	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Run Caliper Tool for Southern Test	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	2	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	1600 cc Compresors	3	49	1	Gas
Remove Launcher & Recievers on Southern Test Portion	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	2	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
R-700 Project Specific Worl					
Excavate Bore Pits @ May School Rd.	Excavators	2	204	8	Diesel
	Dozer	2	254	4	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	2	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Complete Bore @ May School Rd.	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks	1	300	4	Diesel
	Coating Compressor	1	49	4	Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	4	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	2	Diesel
	Foreman Pickups	2	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup	1	300	2	Diesel
	29 Ton Boom Truck	1	500	4	Diesel
	Akkerman Guided Bore Machine	1	150	8	Diesel
	36-600 American Auger Bore Mac	1	116	8	Diesel
	Bore Rig Manager Vehicle	1	300	2	Diesel
	Crew Van	1	300	2	Diesel
Install Pipeline from May School Rd. to N. Livermore Ave (69+50 - 112+00, 4,450')	Excavators	2	204	8	Diesel
	Dozer	1	254	4	Diesel
	Loader		232		Diesel
	Side Booms	1	307	2	Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks	1	300	1	Diesel
	Coating Compressor	1	49	8	Diesel
	Welding Trucks	4	260	1	Diesel
	Welding Machines	4	22	8	Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig	1	385	2	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	2	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Trencher	1	650	6	
	Ozzie Padder (OPP-300)	1	440	4	Diesel
	Compactor	1	250	4	Diesel
	Dump Trucks	2	350	4	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Excavate Tie-in Bell Hole @ N. Livermore Ave. (110+00)	Excavators	1	204	8	Diesel
	Dozer	1	254	3	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Fabricate & Install Jump Ups @ N. Livermore Ave (110+00)	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Excavators	2	204	8	Diesel
	Dozer	1	254	4	Diesel
	Loader		232		Diesel
	Side Booms	1	307	2	Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks	1	300	1	Diesel
	Coating Compressor	1	49	8	Diesel
	Welding Trucks	4	260	1	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Install Pipeline 0+00 - 213+90	Welding Machines	4	22	8	Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig	1	385	2	Diesel
	Pipe Bender				
	Ozzie Padder (OPP-300)	1	440	4	Diesel
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	2	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Compactor	1	250	4	Diesel
	Dump Trucks	2	350	4	Diesel
Excavate Tie-in Bell Hole @ Dagnino Rd. (0+00)	Excavators	1	204	8	Diesel
	Dozer	1	254	3	Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Fabricate & Install Jump UP @ Dagnino Rd. (0+00)	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Prep Strength Test Mid Portion	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
Fill 24" Mid Portion Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Pioneer Pump	1	315	8	Diesel
	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Strength Test Mid Portion	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Test Pump	1	350	4	Diesel
	Test Pump Trcuk	1	350	0.25	Diesel
Dewater Mid Portion	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Pioneer Pump	1	315	8	Diesel
Cut Off Test Heads & Install L&R's on Mid Portion Test	Excavators	2	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	4	260	1	Diesel
	Welding Machines	4	22	8	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
	Foreman Pickups		360		Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Dry Mid Portion Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	2	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Dryer	1	300	8	
Run Caliper Tool for Mid Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	2	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	1600 cc Compresors	3	400	1	Gas

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Remove Launcher & Recievers on Mid Portion Test	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	2	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Remove Jump Up & Install Tie-in Can	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	4	260	1	Diesel
	Welding Machines	4	22	4	Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	2	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
R-707					
	Excavators	2	204	8	Diesel
	Dozer	2	254	4	Diesel
	Loader		232		Diesel
	Side Booms	2	307	4	Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks	1	300	1	Diesel
	Coating Compressor	1	49	8	Diesel
	Welding Trucks	2	260	1	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Excavate & Install Pipeline 0+00 - 41+04	Welding Machines	2	22	8	Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder		440		
	Water Trucks	1	200	8	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	2	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Ozzie Padder (OPP-300)	1	440	8	Diesel
	Trencher	1	415	4	Diesel
	Dump Trucks	2	350	5	Diesel
	Compactor	1	250	4	Diesel
	4x4 Utility Vehichle	3	50	8	Diesel
Install Test Jump Ups	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	1	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig	1	385	1	Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Prep Strength Test Northern 24"	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Fill 24" Northern Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Pioneer Pump	1	415	8	Diesel
Strength Test Norther Portion	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Test Pump	1	350	4	Diesel
	Test Pump Trcuk	1	350	0.25	Diesel
	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
Dewater Northern Test	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	2	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	4	Diesel
	Foreman Pickups	1	360	1	Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups	1	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	Pioneer Pump	1	315	8	Diesel
Cut Off Test Heads & Install Launchers and Recievers	Excavators	2	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	4	260	1	Diesel
	Welding Machines	4	22	8	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups	1	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
Dry Northern Test	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
	Pipe Bender				
	Ozzie Padder				
	Water Trucks	4	200	2	Diesel
	Foreman Pickups	3	360	1	Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	**Equipment Type**	**Number of Equipment Units for Phase**	**Estimated Horsepowe**	**Estimated Hours of Use per Day for Phase**	**Fuel Type**
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel
	Dryer	1	300	8	
	Excavators		204		Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks		260		Diesel
	Welding Machines		22		Diesel
	Crew Trucks	1	300	1	Diesel
	X-Ray Rig		385		Diesel
Run Caliper Tool	Pipe Bender				
	Ozzie Padder				
	Water Trucks	2	200	2	Diesel
	Foreman Pickups	3	360	1	Diesel
	Inspector Pickups	5	325	1	Diesel
	Field Engineering Pickups	3	365	1	Gas
	Supervisor Pickups	1	365	1	Gas
	Flatbed Pickup		300		Diesel
	1600 cc Compresors	3	400	1	Gas
	Excavators	1	204	2	Diesel
	Dozer		254		Diesel
	Loader		232		Diesel
	Side Booms		307		Diesel
	Backhoe		130		Diesel
	Telehandler		142		Diesel
	Coating Trucks		300		Diesel
	Coating Compressor		49		Diesel
	Welding Trucks	2	260	2	Diesel
	Welding Machines	2	22	2	Diesel
	Crew Trucks		300		Diesel
	X-Ray Rig		385		Diesel
Remove Launchers And Recievers	Pipe Bender				
	Ozzie Padder				
	Water Trucks	1	200	1	Diesel
	Foreman Pickups		360		Diesel
	Inspector Pickups		325		Diesel
	Field Engineering Pickups		365		Gas
	Supervisor Pickups		365		Gas
	Flatbed Pickup		300		Diesel

PG&E L131 REPLACEMENT PROJECTS (R649, R700, R70					
Construction Phase	Equipment Type	Number of Equipment Units for Phase	Estimated Horsepowe	Estimated Hours of Use per Day for Phase	Fuel Type

TABLE A-3
Construction Emissions
Gas Line 131

Equipment / Vehicle List [a]	Equipment / Vehicle Type	Quantity [a]	Quantity Units	Number of Days Used [a]	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]									Emissions (tons/project) [d]								CO_2 Emissions (metric tons/project) [d]
							VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	CO_2	VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	
2018: R649, R700, R707																								
BMP Installation																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	4	--	15		1.25	0.000	0.017	0.001	0.000	0.000	0.000	9.798	0.980	3.834	0.000	0.000	0.000	0.000	0.000	0.000	0.073	0.007	0.026
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	5	--	15		1.25	0.002	0.008	0.041	0.000	0.001	0.001	12.248	1.225	15.850	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.009	0.108
Polaris Razor	Construction Equipment	1	--	15	8		0.275	1.583	2.473	0.002	0.194	0.178	--	--	202.638	0.002	0.012	0.019	0.000	0.001	0.001	--	--	1.379
Trencher	Construction Equipment	1		15	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.003	0.017	0.016	0.000	0.001	0.001	--	--	1.645
TOTAL							0.736	3.821	4.702	0.004	0.375	0.346	22.046	2.205	464.103	0.006	0.029	0.035	0.000	0.003	0.003	0.165	0.017	3.158
Pipe Fabrication Bin Support																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	1	--	3		1.25	0.000	0.004	0.000	0.000	0.000	0.000	2.450	0.245	0.959	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.001
Semi with Rocket Laucher	Construction Equipment	3	--	3	2		0.649	3.527	6.989	0.011	0.256	0.235	--	--	1,116.263	0.001	0.005	0.010	0.000	0.000	0.000	--	--	1.519
TOTAL							0.649	3.532	6.990	0.011	0.256	0.235	2.450	0.245	1,117.222	0.001	0.005	0.010	0.000	0.000	0.000	0.004	0.000	1.520
Pipeline Cleaning Support Lab & Bins																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	2	--	5		1.25	0.000	0.009	0.001	0.000	0.000	0.000	4.899	0.490	1.917	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001	0.004
Semi with Rocket Laucher	Construction Equipment	3	--	5	2		0.649	3.527	6.989	0.011	0.256	0.235	--	--	1,116.263	0.002	0.009	0.017	0.000	0.001	0.001	--	--	2.532
TOTAL							0.649	3.536	6.990	0.011	0.256	0.235	4.899	0.490	1,118.180	0.002	0.009	0.017	0.000	0.001	0.001	0.012	0.001	2.536
Waste Off-Haul																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	1	--	6		1.25	0.000	0.004	0.000	0.000	0.000	0.000	2.450	0.245	0.959	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.001	0.003
Tractor Trailer	HHDT	1	--	6		24.8	0.008	0.009	0.032	0.000	0.001	0.001	--	--	89.485	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.244
Semi with 120BBL Trailer	HHDT	6	--	6		24.8	0.049	0.056	0.190	0.002	0.009	0.008	--	--	536.910	0.000	0.000	0.001	0.000	0.000	0.000	--	--	1.461
Semi with Rocket Laucher	Construction Equipment	6	--	6	2		1.298	7.055	13.978	0.022	0.511	0.470	--	--	2,232.527	0.004	0.021	0.042	0.000	0.002	0.001	--	--	6.076
TOTAL							1.356	7.125	14.200	0.024	0.521	0.480	2.450	0.245	2,859.880	0.004	0.021	0.043	0.000	0.002	0.001	0.007	0.001	7.783
Tank Cleaning																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	1	--	3		1.25	0.000	0.004	0.000	0.000	0.000	0.000	2.450	0.245	0.959	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.001
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	1	--	3		1.25	0.000	0.002	0.008	0.000	0.000	0.000	--	--	3.170	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.004
Semi with 120BBL Trailer	HHDT	1	--	3		24.8	0.008	0.009	0.032	0.000	0.001	0.001	--	--	89.485	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.122
Pressure Washer	Construction Equipment	1		3	8		0.036	0.189	0.250	0.000	0.013	0.013	--	--	30.069	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.041
TOTAL							0.045	0.205	0.290	0.001	0.014	0.014	2.450	0.245	123.682	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.168
Site Restoration																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	4	--	15		1.25	0.000	0.017	0.001	0.000	0.000	0.000	9.798	0.980	3.834	0.000	0.000	0.000	0.000	0.000	0.000	0.073	0.007	0.026
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	2	--	15		1.25	0.001	0.003	0.016	0.000	0.001	0.001	4.899	0.490	6.340	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.004	0.043
Trencher	Construction Equipment	1		15	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.003	0.017	0.016	0.000	0.001	0.001	--	--	1.645
Terex Tractor	Construction Equipment	1	--	15	8	--	0.211	1.855	2.087	0.003	0.148	0.136			248.282	0.002	0.014	0.016	0.000	0.001	0.001	--	--	1.689
Hydro Seeder	Construction Equipment	1		15	8		0.252	1.176	1.564	0.003	0.084	0.084	--	--	186.627	0.002	0.009	0.012	0.000	0.001	0.001	--	--	1.270
Polaris Razor	Construction Equipment	1		15	8		0.275	1.583	2.473	0.002	0.194	0.178	--	--	202.638	0.002	0.012	0.019	0.000	0.001	0.001	--	--	1.379
TOTAL							1.197	6.846	8.329	0.009	0.606	0.565	14.698	1.470	889.502	0.009	0.051	0.062	0.000	0.005	0.004	0.110	0.011	6.052
Mobilization																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	17	--	4		1.25	0.001	0.073	0.006	0.000	0.000	0.000	41.643	4.164	16.295	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.008	0.030
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	1	--	4		1.25	0.000	0.002	0.008	0.000	0.000	0.000	2.450	0.245	3.170	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.006
Tractor Trailer	HHDT	20	--	4		24.8	0.164	0.187	0.633	0.005	0.029	0.027	--	--	1,789.700	0.000	0.000	0.001	0.000	0.000	0.000	--	--	3.247
Excavator	Construction Equipment	5	--	4	3	--	0.518	2.953	6.649	0.013	0.203	0.187	--	--	1,256.770	0.001	0.006	0.013	0.000	0.000	0.000	--	--	2.280
Bulldozer	Construction Equipment	2		4	3		0.081	2.957	0.349	0.007	0.011	0.011	--	--	669.520	0.000	0.006	0.001	0.000	0.000	0.000	--	--	1.215
Water Truck	Construction Equipment	4	--	4	3	--	0.686	3.103	6.938	0.010	0.283	0.261	--	--	980.431	0.001	0.006	0.014	0.000	0.001	0.001	--	--	1.779
Welding Rig	Construction Equipment	8	--	4	1	--	0.124	4.540	0.537	0.010	0.017	0.017	--	--	1,172.680	0.000	0.009	0.001	0.000	0.000	0.000	--	--	2.128
Side Boom	Construction Equipment	2		4	3		0.073	1.103	0.746	0.006	0.011	0.009	--	--	577.532	0.000	0.002	0.001	0.000	0.000	0.000	--	--	1.048
TOTAL							1.647	14.917	15.866	0.051	0.553	0.513	44.093	4.409	6,466.097	0.003	0.030	0.032	0.000	0.001	0.001	0.088	0.009	11.732
Strip Top Soil North of May School Road																								
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	11		10		1.25	0.005	0.017	0.090	0.000	0.003	0.003	26.945	2.695	34.869	0.000	0.000	0.000	0.000	0.000	0.000	0.135	0.013	0.158
Bulldozer	Construction Equipment	1		10	8		0.108	3.942	0.466	0.009	0.014	0.014	--	--	892.693	0.001	0.020	0.002	0.000	0.000	0.000	--	--	4.049
Water Truck	Construction Equipment	4	--	10	8	--	1.828	8.274	18.501	0.026	0.756	0.697	--	--	2,614.482	0.009	0.041	0.093	0.000	0.004	0.003	--	--	11.859
Grader	Construction Equipment	1		10	6		0.089	3.281	0.388	0.007	0.012	0.012	--	--	731.646	0.000	0.016	0.002	0.000	0.000	0.000	--	--	3.319
TOTAL							2.030	15.515	19.445	0.042	0.785	0.726	26.945	2.695	4,273.691	0.010	0.078	0.097	0.000	0.004	0.004	0.135	0.013	19.385
Strip Top Soil South of May School Road																								
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	11		10		1.25	0.005	0.017	0.090	0.000	0.003	0.003	26.945	2.695	34.869	0.000	0.000	0.000	0.000	0.000	0.000	0.135	0.013	0.158
Bulldozer	Construction Equipment	1		10	8		0.108	3.942	0.466	0.009	0.014	0.014	--	--	892.693	0.001	0.020	0.002	0.000	0.000	0.000	--	--	4.049
Water Truck	Construction Equipment	4	--	10	8	--	1.828	8.274	18.501	0.026	0.756	0.697	--	--	2,614.482	0.009	0.041	0.093	0.000	0.004	0.003	--	--	11.859
Grader	Construction Equipment	1		10	6		0.089	3.281	0.388	0.007	0.012	0.012	--	--	731.646	0.000	0.016	0.002	0.000	0.000	0.000	--	--	3.319
TOTAL							2.030	15.515	19.445	0.042	0.785	0.726	26.945	2.695	4,273.691	0.010	0.078	0.097	0.000	0.004	0.004	0.135	0.013	19.385
Set up Frac Tanks for Strength Test																								
Welding Rig	Construction Equipment	4	--	3	8	--	0.495	18.159	2.146	0.040	0.066	0.066	--	--	4,690.722	0.001	0.027	0.003	0.000	0.000	0.000	--	--	6.383
Excavator	Construction Equipment	1	--	3	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.912
TOTAL							0.771	19.734	5.692	0.046	0.174	0.166	0.000	0.000	5,360.999	0.001	0.030	0.009	0.000	0.000	0.000	0.000	0.000	7.295
Prep for Tie-in Clearance																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	15	--	1		1.25	0.001	0.065	0.005	0.000	0.000	0.000	36.744	3.674	14.378	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.002	0.007
Water Truck	Construction Equipment	4	--	1	8	--	1.828	8.274	18.501	0.026	0.756	0.697	--	--	2,614.482	0.001	0.004	0.009	0.000	0.000	0.000	--	--	1.186
TOTAL							1.829	8.339	18.506	0.026	0.756	0.697	36.744	3.674	2,628.860	0.001	0.004	0.009	0.000	0.000	0.000	0.018	0.002	1.192
Weld Clearance																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	16	--	1		1.25	0.001	0.069	0.005	0.000	0.000	0.000	39.193	3.919	15.336	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.002	0.007
Water Truck	Construction Equipment	4	--	1	8	--	1.828	8.274	18.501	0.026	0.756	0.697	--	--	2,614.482	0.001	0.004	0.009	0.000	0.000	0.000	--	--	1.186
Welding Rig	Construction Equipment	8	--	1	8	--	0.990	36.317	4.292	0.079	0.132	0.132	--	--	9,381.444	0.000	0.018	0.002	0.000	0.000	0.000	--	--	4.255
TOTAL							2.820	44.661	22.799	0.106	0.888	0.829	39.193	3.919	12,011.262	0.001	0.022	0.011	0.000	0.000	0.000	0.020	0.002	5.448
Tie-In Pipe																								

TABLE A-3
Construction Emissions
Gas Line 131

Equipment / Vehicle List [a]	Equipment / Vehicle Type	Quantity [a]	Quantity Units	Number of Days Used [a]	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]									Emissions (tons/project) [d]								CO_2 Emissions (metric tons/project) [d]
							VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	CO_2	VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	
Onsite Pick-Up (Light Duty)	Light-duty Truck	20	--	1		1.25	0.002	0.086	0.007	0.000	0.000	0.000	48.992	4.899	19.170	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.002	0.009
Water Truck	Construction Equipment	4	--	1	1	--	0.229	1.034	2.313	0.003	0.094	0.087	--	--	326.810	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.148
Welding Rig	Construction Equipment	8	--	1	8	--	0.990	36.317	4.292	0.079	0.132	0.132	--	--	9,381.444	0.000	0.018	0.002	0.000	0.000	0.000	--	--	4.255
TOTAL							1.221	37.438	6.612	0.083	0.227	0.219	48.992	4.899	9,727.424	0.001	0.019	0.003	0.000	0.000	0.000	0.024	0.002	4.412
Right of Way Restoration																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	5		1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.008	0.028
Water Truck	Construction Equipment	4	--	5	8	--	1.828	8.274	18.501	0.026	0.756	0.697	--	--	2,614.482	0.005	0.021	0.046	0.000	0.002	0.002	--	--	5.930
Excavator	Construction Equipment	2	--	5	8	--	0.552	3.150	7.092	0.013	0.216	0.200	--	--	1,340.554	0.001	0.008	0.018	0.000	0.001	0.000	--	--	3.040
Grader	Construction Equipment	1		5	5		0.075	2.734	0.323	0.006	0.010	0.010	--	--	609.705	0.000	0.007	0.001	0.000	0.000	0.000	--	--	1.383
Bulldozer	Construction Equipment	2		5	8		0.215	7.884	0.932	0.018	0.029	0.029			1,785.387	0.001	0.020	0.002	0.000	0.000	0.000	--	--	4.049
TOTAL							2.671	22.099	26.853	0.063	1.011	0.935	31.845	3.184	6,362.589	0.007	0.055	0.067	0.000	0.003	0.002	0.080	0.008	14.430
Complete Demob																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	14	--	12		1.25	0.001	0.060	0.005	0.000	0.000	0.000	34.294	3.429	13.419	0.000	0.000	0.000	0.000	0.000	0.000	0.206	0.021	0.073
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	1	--	12		1.25	0.000	0.002	0.008	0.000	0.000	0.000	2.450	0.245	3.170	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.017
Tractor Trailer	HHDT	20	--	12		24.8	0.164	0.187	0.633	0.005	0.029	0.027	--	--	1,789.700	0.001	0.001	0.004	0.000	0.000	0.000	--	--	9.742
Excavator	Construction Equipment	5	--	12	4	--	0.690	3.938	8.865	0.017	0.270	0.250	--	--	1,675.693	0.004	0.024	0.053	0.000	0.002	0.001	--	--	9.121
Bulldozer	Construction Equipment	2		12	4		0.108	3.942	0.466	0.009	0.014	0.014	--	--	892.693	0.001	0.024	0.003	0.000	0.000	0.000	--	--	4.859
Loader	Construction Equipment	1		12	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.012	0.001	0.000	0.000	0.000	--	--	2.430
Water Truck	Construction Equipment	4	--	12	4	--	0.914	4.137	9.251	0.013	0.378	0.349	--	--	1,307.241	0.005	0.025	0.056	0.000	0.002	0.002	--	--	7.115
Welding Rig	Construction Equipment	8	--	12	2	--	0.248	9.079	1.073	0.020	0.033	0.033	--	--	2,345.361	0.001	0.054	0.006	0.000	0.000	0.000	--	--	12.766
Side Boom	Construction Equipment	2		12	2		0.049	0.735	0.498	0.004	0.007	0.006	--	--	385.021	0.000	0.004	0.003	0.000	0.000	0.000	--	--	2.096
TOTAL							2.228	24.052	21.031	0.072	0.739	0.687	36.744	3.674	8,858.645	0.013	0.144	0.126	0.000	0.004	0.004	0.220	0.022	48.219
2018: R707																								
Excavate and Install Pipeline 0+00 - 41+04																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	8	--	69		1.25	0.001	0.034	0.003	0.000	0.000	0.000	19.597	1.960	7.668	0.000	0.001	0.000	0.000	0.000	0.000	0.676	0.068	0.240
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	3		69		1.25	0.001	0.005	0.025	0.000	0.001	0.001	7.349	0.735	9.510	0.000	0.000	0.001	0.000	0.000	0.000	0.254	0.025	0.298
Water Truck	Construction Equipment	1	--	69	8	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.016	0.071	0.160	0.000	0.007	0.006	--	--	20.457
Excavator	Construction Equipment	2	--	69	8	--	0.552	3.150	7.092	0.013	0.216	0.200	--	--	1,340.554	0.019	0.109	0.245	0.000	0.007	0.007	--	--	41.957
Bulldozer	Construction Equipment	2		69	4		0.108	3.942	0.466	0.009	0.014	0.014	--	--	892.693	0.004	0.136	0.016	0.000	0.000	0.000	--	--	27.939
Side Boom	Construction Equipment	2		69	4		0.097	1.471	0.995	0.008	0.014	0.013	--	--	770.042	0.003	0.051	0.034	0.000	0.000	0.000	--	--	24.101
Welding Rig	Construction Equipment	2	--	69	8	--	0.248	9.079	1.073	0.020	0.033	0.033	--	--	2,345.361	0.009	0.313	0.037	0.001	0.001	0.001	--	--	73.405
Polaris Razor	Construction Equipment	3		69	8		0.826	4.749	7.418	0.006	0.581	0.534	--	--	607.913	0.029	0.164	0.256	0.000	0.020	0.018	--	--	19.026
Trencher	Construction Equipment	1		69	4		0.229	1.106	1.093	0.001	0.090	0.083	--	--	120.891	0.008	0.038	0.038	0.000	0.003	0.003	--	--	3.784
Compactor	Construction Equipment	1		69	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.002	0.068	0.008	0.000	0.000	0.000	--	--	13.970
TOTAL							2.573	27.576	23.024	0.068	1.145	1.059	26.945	2.695	7,194.600	0.089	0.951	0.794	0.002	0.040	0.037	0.930	0.093	225.176
Install Jump Up																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	3	--	4	1	1.25	0.000	0.013	0.001	0.000	0.000	0.000	7.349	0.735	2.876	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.005
Water Truck	Construction Equipment	1	--	4	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.148
Welding Rig	Construction Equipment	2	--	4	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.005	0.001	0.000	0.000	0.000	--	--	1.064
Excavator	Construction Equipment	1	--	4	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.304
TOTAL							0.188	2.935	1.734	0.007	0.059	0.055	7.349	0.735	838.488	0.000	0.006	0.003	0.000	0.000	0.000	0.015	0.001	1.521
Prep Strength Test Nothern 24"																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	1	1	1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.002	0.006
Water Truck	Construction Equipment	2	--	1	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.296
TOTAL							0.458	2.125	4.630	0.007	0.189	0.174	31.845	3.184	666.081	0.000	0.001	0.002	0.000	0.000	0.000	0.016	0.002	0.302
Fill 24" Northern Test Portion																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	6	--	2	1	1.25	0.000	0.026	0.002	0.000	0.000	0.000	14.698	1.470	5.751	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.005
Water Truck	Construction Equipment	2	--	2	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.593
Pioneer Pump	Construction Equipment	1		2	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.002	0.002	0.000	0.000	0.000	--	--	0.219
TOTAL							0.916	4.307	6.814	0.009	0.369	0.341	14.698	1.470	901.153	0.001	0.004	0.007	0.000	0.000	0.000	0.015	0.001	0.818
Strength Test Northern Portion																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	6	--	1	1	1.25	0.000	0.026	0.002	0.000	0.000	0.000	14.698	1.470	5.751	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.001	0.003
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
TOTAL							0.058	0.284	0.580	0.001	0.024	0.022	14.698	1.470	87.454	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.001	0.040
Dewater Northern Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	1		1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.001	0.002
Water Truck	Construction Equipment	2	--	1	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.296
Pioneer Pump	Construction Equipment	1		1	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.110
TOTAL							0.916	4.303	6.814	0.009	0.369	0.340	12.248	1.225	900.195	0.000	0.002	0.003	0.000	0.000	0.000	0.006	0.001	0.408
Cut off Test Heads and Install L&Rs																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	1	--	1	1	1.25	0.000	0.004	0.000	0.000	0.000	0.000	2.450	0.245	0.959	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.000
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Welding Rig	Construction Equipment	4	--	1	8	--	0.495	18.159	2.146	0.040	0.066	0.066	--	--	4,690.722	0.000	0.009	0.001	0.000	0.000	0.000	--	--	2.128
Excavator	Construction Equipment	2	--	1	2	--	0.138	0.788	1.773	0.003	0.054	0.050	--	--	335.139	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.152
TOTAL							0.691	19.209	4.498	0.044	0.144	0.138	2.450	0.245	5,108.522	0.000	0.010	0.002	0.000	0.000	0.000	0.000	0.000	2.317
Dry Northern Test Section																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	9	--	2	--	1.25	0.001	0.039	0.003	0.000	0.000	0.000	22.046	2.205	8.627	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.002	0.008
Water Truck	Construction Equipment	4	--	2	2	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.593
Dryer	Construction Equipment	1		2	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.002	0.002	0.000	0.000	0.000	--	--	0.219
TOTAL							0.916	4.320	6.815	0.009	0.369	0.341	22.046	2.205	904.029	0.001	0.004	0.007	0.000	0.000	0.000	0.022	0.002	0.820
Run Caliper Tool for Northern Test																								

TABLE A-3
Construction Emissions
Gas Line 131

Equipment / Vehicle List [a]	Equipment / Vehicle Type	Quantity [a]	Quantity Units	Number of Days Used [a]	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]									Emissions (tons/project) [d]								CO_2 Emissions (metric tons/project) [d]
							VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	CO_2	VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	1	--	1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.002	0.006
Water Truck	Construction Equipment	2	--	1	2	--	0.229	1.034	2.313	0.003	0.094	0.087	--	--	326.810	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.148
Air Compressor	Construction Equipment	3	--	1	1	--	0.094	0.582	0.630	0.001	0.047	0.047	--	--	88.402	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.040
TOTAL							0.323	1.673	2.947	0.004	0.142	0.134	31.845	3.184	427.673	0.000	0.001	0.001	0.000	0.000	0.000	0.016	0.002	0.194
Remove Launcher and Receivers																								
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Welding Rig	Construction Equipment	2	--	1	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.001	0.000	0.000	0.000	0.000	--	--	0.266
Excavator	Construction Equipment	1	--	1	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	168.680	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.077
TOTAL							0.188	2.922	1.733	0.007	0.059	0.055	0.000	0.000	836.723	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.380
2018: R700																								
Excavate Bore Pits																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	10		1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.061	0.006	0.022
Water Truck	Construction Equipment	1	--	10	2	--	0.114	0.517	1.156	0.002	0.047	0.044	--	--	163.405	0.001	0.003	0.006	0.000	0.000	0.000	--	--	0.741
Excavator	Construction Equipment	2	--	10	8	--	0.552	3.150	7.092	0.013	0.216	0.200	--	--	1,340.554	0.003	0.016	0.035	0.000	0.001	0.001	--	--	6.081
Bulldozer	Construction Equipment	2		10	4		0.108	3.942	0.466	0.009	0.014	0.014	--	--	892.693	0.001	0.020	0.002	0.000	0.000	0.000	--	--	4.049
TOTAL							0.775	7.631	8.716	0.024	0.278	0.258	12.248	1.225	2,401.445	0.004	0.038	0.044	0.000	0.001	0.001	0.061	0.006	10.893
Complete Bore																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	7	--	16		1.25	0.001	0.030	0.002	0.000	0.000	0.000	17.147	1.715	6.710	0.000	0.000	0.000	0.000	0.000	0.000	0.137	0.014	0.049
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	1		16		1.25	0.000	0.002	0.008	0.000	0.000	0.000	2.450	0.245	3.170	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.002	0.023
Water Truck	Construction Equipment	1	--	16	2	--	0.114	0.517	1.156	0.002	0.047	0.044	--	--	163.405	0.001	0.004	0.009	0.000	0.000	0.000	--	--	1.186
Excavator	Construction Equipment	1	--	16	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.001	0.003	0.007	0.000	0.000	0.000	--	--	1.216
Welding Rig	Construction Equipment	2	--	16	4	--	0.124	4.540	0.537	0.010	0.017	0.017	--	--	1,172.680	0.001	0.036	0.004	0.000	0.000	0.000	--	--	8.511
Bore Machine	Construction Equipment	2	--	16	8	--	0.914	4.137	9.251	0.013	0.378	0.349	--	--	1,307.241	0.007	0.033	0.074	0.000	0.003	0.003	--	--	9.487
Boom Truck	Construction Equipment	1		16	4		0.049	0.735	0.498	0.004	0.007	0.006	--	--	385.021	0.000	0.006	0.004	0.000	0.000	0.000	--	--	2.794
TOTAL							1.271	10.355	12.338	0.030	0.476	0.440	19.597	1.960	3,205.797	0.010	0.083	0.099	0.000	0.004	0.004	0.157	0.016	23.266
Excavate Bore Pits																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	10		1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.061	0.006	0.022
Water Truck	Construction Equipment	1	--	10	2	--	0.114	0.517	1.156	0.002	0.047	0.044	--	--	163.405	0.001	0.003	0.006	0.000	0.000	0.000	--	--	0.741
Excavator	Construction Equipment	2	--	10	8	--	0.552	3.150	7.092	0.013	0.216	0.200	--	--	1,340.554	0.003	0.016	0.035	0.000	0.001	0.001	--	--	6.081
Bulldozer	Construction Equipment	2		10	4		0.108	3.942	0.466	0.009	0.014	0.014	--	--	892.693	0.001	0.020	0.002	0.000	0.000	0.000	--	--	4.049
TOTAL							0.775	7.631	8.716	0.024	0.278	0.258	12.248	1.225	2,401.445	0.004	0.038	0.044	0.000	0.001	0.001	0.061	0.006	10.893
Complete Bore																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	7	--	16		1.25	0.001	0.030	0.002	0.000	0.000	0.000	17.147	1.715	6.710	0.000	0.000	0.000	0.000	0.000	0.000	0.137	0.014	0.049
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	1		16		1.25	0.000	0.002	0.008	0.000	0.000	0.000	2.450	0.245	3.170	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.002	0.023
Water Truck	Construction Equipment	1	--	16	2	--	0.114	0.517	1.156	0.002	0.047	0.044	--	--	163.405	0.001	0.004	0.009	0.000	0.000	0.000	--	--	1.186
Excavator	Construction Equipment	1	--	16	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.001	0.003	0.007	0.000	0.000	0.000	--	--	1.216
Welding Rig	Construction Equipment	2	--	16	4	--	0.124	4.540	0.537	0.010	0.017	0.017	--	--	1,172.680	0.001	0.036	0.004	0.000	0.000	0.000	--	--	8.511
Bore Machine	Construction Equipment	2	--	16	8	--	0.914	4.137	9.251	0.013	0.378	0.349	--	--	1,307.241	0.007	0.033	0.074	0.000	0.003	0.003	--	--	9.487
Boom Truck	Construction Equipment	1		16	4		0.049	0.735	0.498	0.004	0.007	0.006	--	--	385.021	0.000	0.006	0.004	0.000	0.000	0.000	--	--	2.794
TOTAL							1.271	10.355	12.338	0.030	0.476	0.440	19.597	1.960	3,205.797	0.010	0.083	0.099	0.000	0.004	0.004	0.157	0.016	23.266
Install Pipeline from May School Road																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	11	--	1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.007	0.024
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	4		11		1.25	0.002	0.006	0.033	0.000	0.001	0.001	9.798	0.980	12.680	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.005	0.063
Air Compressor	Construction Equipment	1	--	11	8	--	0.250	1.553	1.680	0.002	0.126	0.126	--	--	235.739	0.001	0.009	0.009	0.000	0.001	0.001	--	--	1.176
Water Truck	Construction Equipment	2	--	11	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.003	0.011	0.025	0.000	0.001	0.001	--	--	3.261
Bulldozer	Construction Equipment	1		11	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.011	0.001	0.000	0.000	0.000	--	--	2.227
Welding Rig	Construction Equipment	4	--	11	8	--	0.495	18.159	2.146	0.040	0.066	0.066	--	--	4,690.722	0.003	0.100	0.012	0.000	0.000	0.000	--	--	23.404
Side Boom	Construction Equipment	1		11	2		0.024	0.368	0.249	0.002	0.004	0.003	--	--	192.511	0.000	0.002	0.001	0.000	0.000	0.000	--	--	0.961
Excavator	Construction Equipment	2	--	11	8	--	0.552	3.150	7.092	0.013	0.216	0.200	--	--	1,340.554	0.003	0.017	0.039	0.000	0.001	0.001	--	--	6.689
Trencher	Construction Equipment	1		11	6		0.344	1.659	1.640	0.002	0.135	0.125	--	--	181.336	0.002	0.009	0.009	0.000	0.001	0.001	--	--	0.905
Compactor	Construction Equipment	1		11	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.011	0.001	0.000	0.000	0.000	--	--	2.227
TOTAL							2.232	30.928	17.933	0.075	0.751	0.709	22.046	2.205	8,204.649	0.012	0.170	0.099	0.000	0.004	0.004	0.121	0.012	40.937
Excavate Tie-in																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	4	--	3	--	1.25	0.000	0.017	0.001	0.000	0.000	0.000	9.798	0.980	3.834	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.005
Water Truck	Construction Equipment	1	--	3	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.111
Bulldozer	Construction Equipment	1		3	3		0.040	1.478	0.175	0.003	0.005	0.005	--	--	334.760	0.000	0.002	0.000	0.000	0.000	0.000	--	--	0.456

TABLE A-3
Construction Emissions
Gas Line 131

Equipment / Vehicle List [a]	Equipment / Vehicle Type	Quantity [a]	Quantity Units	Number of Days Used [a]	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]									Emissions (tons/project) [d]								CO_2 Emissions (metric tons/project) [d]
							VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	CO_2	VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	
Excavator	Construction Equipment	1	--	3	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.912
TOTAL							0.374	3.329	4.300	0.011	0.137	0.127	9.798	0.980	1,090.574	0.001	0.005	0.006	0.000	0.000	0.000	0.015	0.001	1.484
Fabricate and Install Jump Up																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	3	--	3	1	1.25	0.000	0.013	0.001	0.000	0.000	0.000	7.349	0.735	2.876	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.001	0.004
Water Truck	Construction Equipment	1	--	3	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.111
Welding Rig	Construction Equipment	2	--	3	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.003	0.000	0.000	0.000	0.000	--	--	0.798
Excavator	Construction Equipment	1	--	3	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.228
TOTAL							0.188	2.935	1.734	0.007	0.059	0.055	7.349	0.735	838.488	0.000	0.004	0.003	0.000	0.000	0.000	0.011	0.001	1.141
Install Pipeline 0+00 - 213+90																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	7	--	55	--	1.25	0.001	0.030	0.002	0.000	0.000	0.000	17.147	1.715	6.710	0.000	0.001	0.000	0.000	0.000	0.000	0.472	0.047	0.167
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	4		55		1.25	0.002	0.006	0.033	0.000	0.001	0.001	9.798	0.980	12.680	0.000	0.000	0.001	0.000	0.000	0.000	0.269	0.027	0.316
Air Compressor	Construction Equipment	1	--	55	8	--	0.250	1.553	1.680	0.002	0.126	0.126	--	--	235.739	0.007	0.043	0.046	0.000	0.003	0.003	--	--	5.881
Water Truck	Construction Equipment	2	--	55	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.013	0.057	0.127	0.000	0.005	0.005	--	--	16.306
Bulldozer	Construction Equipment	1		55	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.001	0.054	0.006	0.000	0.000	0.000	--	--	11.135
Welding Rig	Construction Equipment	4	--	55	8	--	0.495	18.159	2.146	0.040	0.066	0.066	--	--	4,690.722	0.014	0.499	0.059	0.001	0.002	0.002	--	--	117.022
Side Boom	Construction Equipment	1		55	2		0.024	0.368	0.249	0.002	0.004	0.003	--	--	192.511	0.001	0.010	0.007	0.000	0.000	0.000	--	--	4.803
Excavator	Construction Equipment	2	--	55	8	--	0.552	3.150	7.092	0.013	0.216	0.200	--	--	1,340.554	0.015	0.087	0.195	0.000	0.006	0.005	--	--	33.444
Compactor	Construction Equipment	1		55	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.001	0.054	0.006	0.000	0.000	0.000	--	--	11.135
TOTAL							1.889	29.277	16.294	0.073	0.616	0.585	26.945	2.695	8,025.229	0.052	0.805	0.448	0.002	0.017	0.016	0.741	0.074	200.210
Excavate Tie-in																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	4	--	3	--	1.25	0.000	0.017	0.001	0.000	0.000	0.000	9.798	0.980	3.834	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.005
Water Truck	Construction Equipment	1	--	3	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.111
Bulldozer	Construction Equipment	1		3	3		0.040	1.478	0.175	0.003	0.005	0.005	--	--	334.760	0.000	0.002	0.000	0.000	0.000	0.000	--	--	0.456
Excavator	Construction Equipment	1	--	3	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.912
TOTAL							0.374	3.329	4.300	0.011	0.137	0.127	9.798	0.980	1,090.574	0.001	0.005	0.006	0.000	0.000	0.000	0.015	0.001	1.484
Fabricate and Install Jump Up																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	3	--	3	1	1.25	0.000	0.013	0.001	0.000	0.000	0.000	7.349	0.735	2.876	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.001	0.004
Water Truck	Construction Equipment	1	--	3	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.111
Welding Rig	Construction Equipment	2	--	3	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.003	0.000	0.000	0.000	0.000	--	--	0.798
Excavator	Construction Equipment	1	--	3	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.228
TOTAL							0.188	2.935	1.734	0.007	0.059	0.055	7.349	0.735	838.488	0.000	0.004	0.003	0.000	0.000	0.000	0.011	0.001	1.141
Prep Strength Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	1	1	1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.002	0.006
Water Truck	Construction Equipment	2	--	1	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.296
TOTAL							0.458	2.125	4.630	0.007	0.189	0.174	31.845	3.184	666.081	0.000	0.001	0.002	0.000	0.000	0.000	0.016	0.002	0.302
Fill 24" Mid Portion Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	6	--	2	1	1.25	0.000	0.026	0.002	0.000	0.000	0.000	14.698	1.470	5.751	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.005
Water Truck	Construction Equipment	2	--	2	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.593
Pioneer Pump	Construction Equipment	1		2	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.002	0.002	0.000	0.000	0.000	--	--	0.219
TOTAL							0.916	4.307	6.814	0.009	0.369	0.341	14.698	1.470	901.153	0.001	0.004	0.007	0.000	0.000	0.000	0.015	0.001	0.818
Strength Test Mid Portion																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	7	--	1	1	1.25	0.001	0.030	0.002	0.000	0.000	0.000	17.147	1.715	6.710	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.001	0.003
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Test Pump	Construction Equipment	1		1	4		0.126	0.588	0.782	0.001	0.042	0.042			93.313	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.042
TOTAL							0.183	0.877	1.362	0.002	0.066	0.064	17.147	1.715	181.725	0.000	0.000	0.001	0.000	0.000	0.000	0.009	0.001	0.082
Dewater Mid Portion Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	1	1	1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.001	0.002
Water Truck	Construction Equipment	2	--	1	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.296
Pioneer Pump	Construction Equipment	1		1	4		0.126	0.588	0.782	0.001	0.042	0.042			93.313	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.042
TOTAL							0.583	2.678	5.409	0.008	0.231	0.216	12.248	1.225	751.726	0.000	0.001	0.003	0.000	0.000	0.000	0.006	0.001	0.341
Cut off Test Heads and Install L&Rs																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	1	--	1	1	1.25	0.000	0.004	0.000	0.000	0.000	0.000	2.450	0.245	0.959	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Welding Rig	Construction Equipment	4	--	1	8	--	0.495	18.159	2.146	0.040	0.066	0.066	--	--	4,690.722	0.000	0.009	0.001	0.000	0.000	0.000	--	--	2.128
Excavator	Construction Equipment	2	--	1	2	--	0.138	0.788	1.773	0.003	0.054	0.050	--	--	335.139	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.152
TOTAL							0.691	19.209	4.498	0.044	0.144	0.138	2.450	0.245	5,108.522	0.000	0.010	0.002	0.000	0.000	0.000	0.001	0.000	2.317
Dry Mid Test Section																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	9	--	2	--	1.25	0.001	0.039	0.003	0.000	0.000	0.000	22.046	2.205	8.627	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.002	0.008
Water Truck	Construction Equipment	1	--	2	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.074
Dryer	Construction Equipment	1		2	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.002	0.002	0.000	0.000	0.000	--	--	0.219
TOTAL							0.516	2.510	2.768	0.003	0.204	0.188	22.046	2.205	332.111	0.001	0.003	0.003	0.000	0.000	0.000	0.022	0.002	0.301
Run Caliper Tool for Mid Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	1	--	1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.002	0.006
Water Truck	Construction Equipment	2	--	1	2	--	0.229	1.034	2.313	0.003	0.094	0.087	--	--	326.810	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.148
Air Compressor	Construction Equipment	3	--	1	1	--	0.094	0.582	0.630	0.001	0.047	0.047	--	--	88.402	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.040
TOTAL							0.323	1.673	2.947	0.004	0.142	0.134	31.845	3.184	427.673	0.000	0.001	0.001	0.000	0.000	0.000	0.016	0.002	0.194
Remove Launcher and Receivers																								
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Welding Rig	Construction Equipment	2	--	1	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.001	0.000	0.000	0.000	0.000	--	--	0.266
Excavator	Construction Equipment	1	--	1	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.076
TOTAL							0.188	2.922	1.733	0.007	0.059	0.055	0.000	0.000	835.612	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.379

TABLE A-3
Construction Emissions
Gas Line 131

Equipment / Vehicle List [a]	Equipment / Vehicle Type	Quantity [a]	Quantity Units	Number of Days Used [a]	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]									Emissions (tons/project) [d]								CO_2 Emissions (metric tons/project) [d]
							VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	CO_2	VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	
Remove Jump Up & Install Tie-in																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	7	--	1	--	1.25	0.001	0.030	0.002	0.000	0.000	0.000	17.147	1.715	6.710	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.001	0.003
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Welding Rig	Construction Equipment	4	--	1	4	--	0.248	9.079	1.073	0.020	0.033	0.033	--	--	2,345.361	0.000	0.005	0.001	0.000	0.000	0.000	--	--	1.064
Excavator	Construction Equipment	1	--	1	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.076
TOTAL							0.374	9.762	2.540	0.022	0.084	0.080	17.147	1.715	2,601.342	0.000	0.005	0.001	0.000	0.000	0.000	0.009	0.001	1.180
R649 Project (Southern Section Going to Creek)																								
Excavate Tie-in																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	4	--	2	4	1.25	0.000	0.017	0.001	0.000	0.000	0.000	9.798	0.980	3.834	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.001	0.003
Water Truck	Construction Equipment	1	--	2	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.074
Excavator	Construction Equipment	1	--	2	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.000	0.002	0.004	0.000	0.000	0.000	--	--	0.608
Bulldozer	Construction Equipment	1		2	3		0.040	1.478	0.175	0.003	0.005	0.005	--	--	334.760	0.000	0.001	0.000	0.000	0.000	0.000	--	--	0.304
TOTAL							0.374	3.329	4.300	0.011	0.137	0.127	9.798	0.980	1,090.574	0.000	0.003	0.004	0.000	0.000	0.000	0.010	0.001	0.989
Fabricate and Install Jump Up																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	3	--	2	1	1.25	0.000	0.013	0.001	0.000	0.000	0.000	7.349	0.735	2.876	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.001	0.003
Water Truck	Construction Equipment	1	--	2	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.074
Welding Rig	Construction Equipment	2	--	2	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.002	0.000	0.000	0.000	0.000	--	--	0.532
Excavator	Construction Equipment	1	--	2	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	167.569	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.152
TOTAL							0.188	2.935	1.734	0.007	0.059	0.055	7.349	0.735	838.488	0.000	0.003	0.002	0.000	0.000	0.000	0.007	0.001	0.761
Install Pipeline (Portola Rd to R-700)																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	8	--	4		1.25	0.001	0.034	0.003	0.000	0.000	0.000	19.597	1.960	7.668	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.004	0.014
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	3		4		1.25	0.001	0.005	0.025	0.000	0.001	0.001	7.349	0.735	9.510	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.017
Side Booom	Construction Equipment	2		4	4		0.097	1.471	0.995	0.008	0.014	0.013	--	--	770.042	0.000	0.003	0.002	0.000	0.000	0.000	--	--	1.397
Welding Rig	Construction Equipment	2	--	4	8	--	0.248	9.079	1.073	0.020	0.033	0.033	--	--	2,345.361	0.000	0.018	0.002	0.000	0.000	0.000	--	--	4.255
Trencher	Construction Equipment	1		4	6		0.344	1.659	1.640	0.002	0.135	0.125	--	--	181.336	0.001	0.003	0.003	0.000	0.000	0.000	--	--	0.329
Excavator	Construction Equipment	1	--	4	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.001	0.003	0.007	0.000	0.000	0.000	--	--	1.216
Bulldozer	Construction Equipment	1		4	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.004	0.000	0.000	0.000	0.000	--	--	0.810
Compactor	Construction Equipment	1		4	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.004	0.000	0.000	0.000	0.000	--	--	0.810
TOTAL							1.074	17.766	7.748	0.045	0.306	0.285	26.945	2.695	4,876.888	0.002	0.036	0.015	0.000	0.001	0.001	0.054	0.005	8.848
Install Pipeline (R-646 to Hartman Rd)																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	8	--	4		1.25	0.001	0.034	0.003	0.000	0.000	0.000	19.597	1.960	7.668	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.004	0.014
Onsite Pick-Up (Heavy Duty)	Heavy-duty Truck	3		4		1.25	0.001	0.005	0.025	0.000	0.001	0.001	7.349	0.735	9.510	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.017
Side Booom	Construction Equipment	2		4	4		0.097	1.471	0.995	0.008	0.014	0.013	--	--	770.042	0.000	0.003	0.002	0.000	0.000	0.000	--	--	1.397
Welding Rig	Construction Equipment	2	--	4	8	--	0.248	9.079	1.073	0.020	0.033	0.033	--	--	2,345.361	0.000	0.018	0.002	0.000	0.000	0.000	--	--	4.255
Trencher	Construction Equipment	1		4	6		0.344	1.659	1.640	0.002	0.135	0.125	--	--	181.336	0.001	0.003	0.003	0.000	0.000	0.000	--	--	0.329
Excavator	Construction Equipment	1	--	4	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.001	0.003	0.007	0.000	0.000	0.000	--	--	1.216
Bulldozer	Construction Equipment	1		4	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.004	0.000	0.000	0.000	0.000	--	--	0.810
Compactor	Construction Equipment	1		4	4		0.054	1.971	0.233	0.004	0.007	0.007	--	--	446.347	0.000	0.004	0.000	0.000	0.000	0.000	--	--	0.810
TOTAL							1.074	17.766	7.748	0.045	0.306	0.285	26.945	2.695	4,876.888	0.002	0.036	0.015	0.000	0.001	0.001	0.054	0.005	8.848
Excavate Sniff Holes																								
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Excavator	Construction Equipment	1	--	1	8	--	0.276	1.575	3.546	0.007	0.108	0.100	--	--	670.277	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.304
TOTAL							0.333	1.834	4.124	0.008	0.132	0.122	0.000	0.000	751.980	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.341
Prep Strength Test Southern																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	1	1	1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.002	0.006
Water Truck	Construction Equipment	2	--	1	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.296
TOTAL							0.458	2.125	4.630	0.007	0.189	0.174	31.845	3.184	666.081	0.000	0.001	0.002	0.000	0.000	0.000	0.016	0.002	0.302
Fill 24" Southern Test Portion																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	2	1	1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001	0.004
Water Truck	Construction Equipment	2	--	2	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.593
Pioneer Pump	Construction Equipment	1		2	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.002	0.002	0.000	0.000	0.000	--	--	0.219
TOTAL							0.916	4.303	6.814	0.009	0.369	0.340	12.248	1.225	900.195	0.001	0.004	0.007	0.000	0.000	0.000	0.012	0.001	0.817
Strength Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	6	--	1	1	1.25	0.000	0.026	0.002	0.000	0.000	0.000	14.698	1.470	5.751	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.001	0.003
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Test Pump	Construction Equipment	1		1	4		0.229	1.106	1.093	0.001	0.090	0.083	--	--	120.891	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.055
TOTAL							0.287	1.391	1.674	0.002	0.114	0.105	14.698	1.470	208.344	0.000	0.001	0.001	0.000	0.000	0.000	0.007	0.001	0.095
Dewater Southern Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	5	--	1	1	1.25	0.000	0.022	0.002	0.000	0.000	0.000	12.248	1.225	4.793	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.001	0.002
Water Truck	Construction Equipment	2	--	1	4	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.001	0.002	0.000	0.000	0.000	--	--	0.296
Pioneer Pump	Construction Equipment	1		1	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.110
TOTAL							0.916	4.303	6.814	0.009	0.369	0.340	12.248	1.225	900.195	0.000	0.002	0.003	0.000	0.000	0.000	0.006	0.001	0.408
Cut off Test Heads and Install L&Rs																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	1	--	1	1	1.25	0.000	0.004	0.000	0.000	0.000	0.000	2.450	0.245	0.959	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.037
Welding Rig	Construction Equipment	4	--	1	8	--	0.495	18.159	2.146	0.040	0.066	0.066	--	--	4,690.722	0.000	0.009	0.001	0.000	0.000	0.000	--	--	2.128
Excavator	Construction Equipment	2	--	1	2	--	0.138	0.788	1.773	0.003	0.054	0.050	--	--	335.139	0.000	0.000	0.001	0.000	0.000	0.000	--	--	0.152
TOTAL							0.691	19.209	4.498	0.044	0.144	0.138	2.450	0.245	5,108.522	0.000	0.010	0.002	0.000	0.000	0.000	0.001	0.000	2.317
Dry Southern Test Section																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	9	--	2	--	1.25	0.001	0.039	0.003	0.000	0.000	0.000	22.046	2.205	8.627	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.002	0.008
Water Truck	Construction Equipment	4	--	2	2	--	0.457	2.069	4.625	0.007	0.189	0.174	--	--	653.621	0.000	0.002	0.005	0.000	0.000	0.000	--	--	0.593

TABLE A-3
Construction Emissions
Gas Line 131

Equipment / Vehicle List [a]	Equipment / Vehicle Type	Quantity [a]	Quantity Units	Number of Days Used [a]	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]									Emissions (tons/project) [d]								CO_2 Emissions (metric tons/project) [d]
							VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	CO_2	VOC	CO	NOx	SOx	$PM_{10\_Exhaust}$	$PM_{2.5\_Exhaust}$	$PM_{10\_Fugitive}$	$PM_{2.5\_Fugitive}$	
Dryer	Construction Equipment	1		2	8		0.458	2.213	2.187	0.002	0.180	0.166	--	--	241.782	0.000	0.002	0.002	0.000	0.000	0.000	--	--	0.219
TOTAL							0.916	4.320	6.815	0.009	0.369	0.341	22.046	2.205	904.029	0.001	0.004	0.007	0.000	0.000	0.000	0.022	0.002	0.820
Run Caliper Tool for Southern Test																								
Onsite Pick-Up (Light Duty)	Light-duty Truck	13	--	1	--	1.25	0.001	0.056	0.004	0.000	0.000	0.000	31.845	3.184	12.461	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.002	0.006
Water Truck	Construction Equipment	2	--	1	2	--	0.229	1.034	2.313	0.003	0.094	0.087	--	--	326.810	0.000	0.001	0.001	0.000	0.000	0.000	--	--	0.148
Air Compressor	Construction Equipment	3	--	1	1	--	0.094	0.582	0.630	0.001	0.047	0.047	--	--	88.402	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.040
TOTAL							0.323	1.673	2.947	0.004	0.142	0.134	31.845	3.184	427.673	0.000	0.001	0.001	0.000	0.000	0.000	0.016	0.002	0.194
Remove Launcher and Receivers																								
Water Truck	Construction Equipment	1	--	1	1	--	0.057	0.259	0.578	0.001	0.024	0.022	--	--	81.703	0.000	0.000	0.000	0.000	0.000	0.000			0.037
Welding Rig	Construction Equipment	2	--	1	2	--	0.062	2.270	0.268	0.005	0.008	0.008	--	--	586.340	0.000	0.001	0.000	0.000	0.000	0.000	--	--	0.266
Excavator	Construction Equipment	1	--	1	2	--	0.069	0.394	0.887	0.002	0.027	0.025	--	--	168.680	0.000	0.000	0.000	0.000	0.000	0.000	--	--	0.077
TOTAL							0.188	2.922	1.733	0.007	0.059	0.055	0.000	0.000	836.723	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.380
Entire Project																								
Fugitive Dust [m]	Onsite Cut/Fill	733	yd^3/project	28	--	--	--	--	--	--	--	--	0.958	0.199	--	--	--	--	--	--	--	0.013	0.003	--
Fugitive Dust [n]	Disturbed Surface	0.83	acres/day	28	--	--	--	--	--	--	--	--	5.463	1.136	--	--	--	--	--	--	--	0.076	0.016	--
Fugitive Dust [o]	Open Stockpiles	0.83	acres/day	28	--	--	--	--	--	--	--	--	7.105	1.478	--	--	--	--	--	--	--	0.099	0.021	--
Offsite Worker Commutes [f]	Light-duty Auto/Truck	60	--	125	--	24.8	0.075	4.218	0.317	0.016	0.005	0.005	--	--	1,029.383	0.005	0.264	0.020	0.001	0.000	0.000	--	--	58.365
Sub TOTAL of Fugitive Dust + Offsite Worker							0.075	4.218	0.317	0.016	0.005	0.005	13.525	2.813	1,029.383	0.005	0.264	0.020	0.001	0.000	0.000	0.189	0.039	58.365
2018 PROJECT TOTAL							**52.534**	**557.834**	**461.394**	**1.436**	**19.022**	**17.680**	**1,044.8**	**105.9**	**156,532.4**	**0.285**	**3.306**	**2.539**	**0.009**	**0.109**	**0.102**	**4.105**	**0.431**	**823.0**

Notes:
-- = Parameter not required for computing emissions.

[a] Unless otherwise noted, Equipment / Vehicle List, quantity, hours per day, and activity schedule provided by PG&E.
[b] Hours per Day were provided by PG&E
[c] Onsite vehicles were assumed to travel up to 25% of the total project length (5 miles) each day. Distances for offsite vehicles, including the Diesel Fuel Delivery Truck, 1-Ton Pick-Ups, and Worker Commutes, were taken from Table 4.2 of Appendix A of the*CalEEMod User's Guide* (ENVIRON, 2013). The Diesel Fuel Delivery Truck and 1-Ton Pick-Up distances were taken as the
[d] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	2,204.62	lbs
1 ton =	2,000	lbs
1 yd^3 =	27	ft^3
1 acre =	43,560	ft^2

TABLE A-4

Construction Equipment Emission Factors

Gas Line 131

Emission Factors from OFFROAD2011

Equipment [a]	Horsepower [b]	Load Factor [b]	Emission Factors With APMs (g/bhp-hr) [d]							Emission Factors (g/bhp-hr) [c]						
			VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
2018																
Polaris Razor	55	0.420								0.676	3.885	6.070	0.005	0.475	0.437	497.383
Pressure Washer	10	0.30								0.679	3.580	4.728	0.008	0.237	0.237	568.299
Welding Rig [d]	260	0.45	0.060	2.200	0.260	0.005	0.008	0.008	568.299	0.060	2.200	0.260	0.005	0.008	0.008	568.299
Bore Rig	150	0.50								0.155	1.073	2.153	0.005	0.061	0.056	484.561
Generator	169	0.74								0.319	2.930	2.989	0.006	0.133	0.133	568.299
Air Compressor	49	0.48								0.603	3.744	4.050	0.006	0.304	0.304	568.300
Trencher	50	0.50	0.120	3.700	2.740	0.005	0.008	0.008	548.361	1.039	5.018	4.960	0.005	0.409	0.377	548.361
Backhoe	130	0.37	0.060	3.700	0.260	0.005	0.008	0.008	494.124	0.420	3.692	4.154	0.005	0.294	0.271	494.124
Excavator	204	0.38	0.060	2.200	0.260	0.005	0.008	0.008	493.506	0.202	1.152	2.594	0.005	0.079	0.073	490.257
Pipe Bender (Other Construction Equipment)	173	0.42								0.436	3.263	4.755	0.005	0.250	0.230	487.986
Terex Tractor	77	0.37								0.42	3.69155	4.15444	0.005	0.294	0.271	494.1237
Grader [d]	275	0.41	0.060	2.200	0.260	0.005	0.008	0.008	490.576	0.060	2.200	0.260	0.005	0.008	0.008	490.576
Dozer [d]	254	0.40	0.060	2.200	0.260	0.005	0.008	0.008	498.186	0.060	2.200	0.260	0.005	0.008	0.008	498.186
Sideboom	307	0.29								0.062	0.937	0.634	0.005	0.009	0.008	490.412
Hydro Seeder (Pumps)	49	0.38								0.766	3.580	4.762	0.008	0.256	0.256	568.299
Dump Truck/Trailer/Semi	450	0.38								0.287	1.560	3.090	0.005	0.113	0.104	493.506
Water Trucl	200	0.38								0.341	1.543	3.451	0.005	0.141	0.130	487.635

Notes:

[a] The CAT D6 Dozer and CAT D8 Dozer were categorized as a "Rubber Tired Dozer"; the CAT 572 Sideboom was categorized as a "Crane"; the Water Truck and Dump Truck/Trailer were categorized as "Off-Highway Trucks"; the Welding Rig was categorized as

[b] Horsepower values provided by PG&E and Load Factors taken as the default provided in Table 3.3 of Appendix D of the *CalEEMod User's Guide* (SCAQMD 2017).

[c] Emission Factors in grams per brake-horsepower-hour (g/bhp-hr) taken as the defaults for 2018 provided in Table 3.4 of Appendix D of the *CalEEMod User's Guide* (SCAQMD 2017).

[d] Emission Factors in g/bhp-hr taken from Table 3.5 of Appendix D of the *CalEEMod User's Guide* (SCAQMD 2017) for construction equipment engines that meet or exceed the Tier 3 emission standards, as required by APM AQ-2. Tier 3 Emission

[e] Tier 3 emission factors were not available for equipment less than 25 hp; therefore, mitigated emission factors for equipment between 25 hp and 49 hp were used.

TABLE A-5

Vehicle Emission Factors

Gas Line 131

Emission Factors from EMFAC2014 and AP-4

Vehicle	Vehicle Class[a]	Exhaust Emission Factors (g/mile)[b]							Road Emission Factors		Road Emission Factors With	
		VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
2018												
Onsite Pick-Up (Light Duty)	Light-duty Truck	0.029	1.564	0.124	0.005	0.002	0.002	347.826	888.905	88.891	400.007	40.001
Onsite Pick-Up (Heavy Duty)	Heavy-duty Diesel	0.161	0.560	2.973	0.005	0.095	0.091	1,150.305	888.905	88.891	400.007	40.001
Offsite Worker Commutes[f]	Light-duty Auto/Truck	0.023	1.286	0.097	0.005	0.002	0.002	313.796	888.905	88.891	400.007	40.001
Tractor Trailer	HHDT	0.150	0.171	0.579	0.005	0.026	0.025	1,636.709	0.300	0.075	0.300	0.075

Notes:

[a] The vehicle classes are represented as follows:

Heavy-duty Diesel: Assumed to be 100% HHDT, DSL values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide*

Light-duty Truck: Assumed to be an average of LDT1, GAS and LDT2, GAS values.

Light-duty Auto/Truck: Assumed to be 50% LDA, GAS; 25% LDT1, GAS; and 25% LDT2, GAS values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide*

[b] Exhaust Emission Factors in grams per mile (g/mile) from EMFAC2014 for Alameda County, calendar years 2016 and 2017. EMFAC2007 Vehicle Categories were used. A speed of 40 miles per hour (m

[c] Paved and unpaved road emission factors were calculated using CalEEMod methodology, as described below. Mitigation was not considered for paved road emission factors because the cost of implem

[d] The PM_{10} and $PM_{2.5}$ emission factors include tire and brake wear.

Derivation of Paved Road Emission Factors

Parameter	PM_{10}	$PM_{2.5}$
Average Weight[a]	2.4	2.4
k [b]	1	0.25
sL [a]	0.1	0.1
Emission Factor (g/mile)[c]	**0.300**	**0.075**

Notes:

[a] Average Weight and sL taken as the default value from CalEEMod for Alameda County.

[b] k taken from Table 13.2.1-1 of Section 13.2.1 of *AP-42* (EPA, 2011).

[c] Emission factor calculated using Equation 1 from Section 13.2.1 of *AP-42* (EPA, 2011):

Emission Factor (g/mile) = k (g/mile) x [sL (g/m^2)]$^{0.91}$ x [Average Weight (tons)]$^{1.02}$

Derivation of Unpaved Road Emission Facto

Parameter	PM_{10}	$PM_{2.5}$
Mean Vehicle Weight[a]	16.5	16.5
Silt Content[b]	8.5	8.5
k [c]	1.5	0.15
a [c]	0.9	0.9
b [c]	0.45	0.45
P [d]	63	63
Emission Factor (g/mile)[e]	888.91	88.89
Reduction for Watering 2x Daily[f]	55%	55%
Controlled Emission Factor (g/mil	400.01	40.00

Notes:

[a] Mean vehicle weight assumes that heavy- and light-duty trucks weigh an average of 16.5 tons.

[b] Silt content taken from Table 13.2.2-1 of Section 13.2.2 of *AP-42* (EPA, 2006) for a Construction Site, Scraper Route; this value is consistent with the CalEEMod defaults.

[c] k, a, and b taken from Table 13.2.2-2 of Section 13.2.2 of *AP-42* (EPA, 2006) for industrial roads.

[d] P taken as the CalEEMod default for the climate region of Alameda County.

[e] Emission factor calculated using Equations 1a and 2 from Section 13.2.2 of *AP-42* (EPA, 2006):

Emission Factor (g/mile) = {k (lbs/mile) x [Silt Content (%) / 12]^a} x [Mean Vehicle Weight (tons) / 3]^b x [(365-P) / 365] x 453.6 (g/lb)

[f] Percent reduction taken from Table XI-D of *Mitigation Measures and Control Efficiencies* (SCAQMD, 2007) per APM AQ-1.

TABLE A-6

Fugitive Dust Emission Factors

Gas Line 131

Emission Factors from WRAP Fugitive Dust Handbook

Activity	Emission Factors		
	PM_{10} [a]	$PM_{2.5}$ [b]	Units
Onsite Cut/Fill [c]	0.059	0.012	ton/1,000 yd^3
Disturbed Surface	0.220	0.0458	ton/acre-month
	0.008	0.002	ton/acre-day [d]
Open Stockpiles [e]	85.600	17.805	lbs/acre-day

Notes:

[a] Unless otherwise noted, PM_{10} emission factors taken from Table A-4 of Appendix A of the *Software User's Guide: URBEMIS2007*

[b] $PM_{2.5}$ emissions assumed to be 20.8% of the PM_{10} emissions for construction fugitive dust sources per the *Final - Methodology*

[c] Per the Project Description, assumed that all cut/fill will remain onsite such that the excavated soil will be used as backfill.

[d] Emission factor converted to units of ton/acre-day assuming 6 construction days per week, as described in the Project

[e] PM_{10} emission factor taken from Table A-9-9 of the *SCAQMD CEQA Handbook* (SCAQMD, 1993).

Emission Factors With APMs from WRAP Fugitive Dust Handbook

Activity	Emission Factors		
	PM_{10}	$PM_{2.5}$	Units
Onsite Cut/Fill [a]	0.018	0.004	ton/1,000 cy
Disturbed Surface [b]	0.086	0.018	ton/acre-month
	0.003	0.001	ton/acre-day
Open Stockpiles [c]	8.560	1.780	lbs/acre-day

Notes:

[a] Implementation of APM AQ-1 was assumed to reduce fugitive emissions by increasing soil moisture 69%

[b] Implementation of APM AQ-1 was assumed to reduce fugitive emissions by application of water every 3 61%

[c] Implementation of APM AQ-1 was assumed to reduce fugitive emissions by water application to 90%

Appendix B

Wildlife Constraints Report

WILDLIFE CONSTRAINTS ANALYSIS REPORT FOR THE

PG&E GAS LINE 131 R649, R700 and R707 REPLACEMENT PROJECT

ALAMEDA COUNTY, CALIFORNIA

Prepared for:

Pacific Gas and Electric Company
3401 Crow Canyon Road
San Ramon, CA 94583

Prepared by:

Swaim Biological Incorporated
4435 First St. PMB 312
Livermore, CA 94551

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Abbreviations Used

CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CRLF	California Red-Legged Frog
CTS	California Tiger Salamander
EACCS	East Alameda County Conservation Strategy
FESA	Federal Endangered Species Act
GIS	Geographic Information Systems
L131	Gas Line 131
MP	Mile Post
PG&E	Pacific Gas & Electric Company
SJKF	San Joaquin kit fox
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 Introduction

Pacific Gas and Electric Company (PG&E) owns and operates Gas Line 131 (L131), a 24-inch diameter underground natural gas transmission pipeline. In order to increase its pipeline network safety and reliability, PG&E is proposing to replace an approximately five-mile section of L131 with three contiguous projects located in Alameda County. Construction on the proposed L131 Replacement Projects (collectively referred to as project) is anticipated to begin in 2018.

This report identifies special-status wildlife species that may occur in the project area and to analyze the potential for such resources to constrain project activities. Included in this discussion are a general description of the project and discusses the methods and results of the analysis of potential project constraints associated with special-status wildlife species. Recommendations for avoiding and minimizing impacts to special-status wildlife are provided.

2.0 Project Overview

2.1 Location

The majority of the project is located north of the City of Livermore in an unincorporated part of Alameda County. The project extends from near North Vasco Road in a southwesterly direction for approximately 4.13 miles to its southern end at I-580 (Figure 1). The extreme southern part of the project is located within the limits of the City of Livermore. The project alignment crosses or lies directly adjacent to five public roads, Dagnino Road, May School Road, North Livermore Avenue, Hartman Road, and Portola Avenue. It is located within the limits of the East Alameda County Conservation Strategy (ICF 2010).

2.2 Project Description

Pipeline replacement activities are anticipated to begin in 2018 and are anticipated to take approximately nine months to complete. The new pipeline will replace the existing pipeline in parallel to the existing line. Construction would be completed using a combination of open trench excavation and trenchless construction techniques at certain roadways. An approximately 150-foot to 200-foot wide work area will be necessary along the new pipeline alignment. The work area will be restored to its approximate original contours after construction and the old gas pipeline will either be abandoned in place or removed.

3.0 Methods

The analysis presented in this report included a review of existing information about special-status wildlife known to occur in the project region followed by field surveys to determine whether habitat characteristics associated with each species were present in the assessment area.

3.1 Special-Status Species Definition

For purposes of this analysis, special-status wildlife species are defined as animals that are protected under the California and Federal Endangered Species Acts (CESA and FESA) or other regulations, and species that are considered rare by the scientific community. Special-status species include:

- Animals listed or proposed for listing as threatened or endangered under the CESA (Fish and Game Code §2050 et seq.; 14 CCR §670.1et seq.) or the FESA (50 CFR 17.11);
- Animals that are candidates for possible future listing as threatened or endangered under the FESA (50 CFR 17; FR Vol. 64, No. 205, pages 57533-57547, October 25, 1999); and under the CESA (California Fish and Game Code §2068);
- Animals that meet the definition of endangered, rare, or threatened under the California Environmental Quality Act (CEQA) (14 CCR §15380) that may include species not found on either State or Federal Endangered Species lists;
- Animals that are designated as "species of special concern" by CDFW (2016);
- Animal species that are designated as “fully protected” under California (Fish and Game Code 3511, 4700, 5050, and 5515).
- Bat Species that are designated on the Western Bat Working Group’s (WBWG) Regional Bat Species Priority Matrix as: “Red or High.” These species are considered to be “imperiled or are at high risk of imperilment.”

3.2 Literature Review and Database Queries

Prior to conducting field surveys, a query of federally listed wildlife species for the project area, was obtained from the USFWS’s Sacramento Endangered Species Office IPac website. The list, generated November 11, 2016, is provided in Appendix B. Additional information about the distribution of special-status species in the area was compiled from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) for the U.S. Geological Survey (USGS) quadrangle maps encompassing the project area and all adjacent quadrangles: Clayton, Antioch South, Brentwood, Woodward Island, Diablo, Tassajara, Byron Hot Springs, Clifton Court Forebay, Dublin, Livermore, Altamont, Midway, Niles, La Costa Valley, Mendenhall Springs, and Cedar Mountain (CNDDB 2016) (Appendix C). In addition, aerial imagery of the project area and vicinity, and USGS 7.5-minute topographic maps of the project region were examined to identify habitat and features that could facilitate or deter occupation and movement by wildlife.

Prior to conducting field surveys, the potential for vernal pools to occur within the project area was assessed using a Geographic Information System (GIS) since they provide habitat for several special-status wildlife species. This assessment included the use of a GIS shapefiles depicting known extant, extirpated and protected vernal pool complexes (CDFW 1998; Witham et al. 2014), an examination of aerial photographs of the project vicinity at various scales for evidence of

topographic features (such as mima mounds or hogwallows) that are typically associated with vernal pools (Holland 1998), and an evaluation of the potential for soils found within the project vicinity to support the formation of vernal pools (NRCS 2016).

3.3 Assessment Area

The assessment area is defined as the project footprint which includes an approximately five-mile long work area and its associated staging areas and access routes that may be subject to ground disturbance as a result of project activities.

3.4 Field Surveys

Visual reconnaissance surveys of the project area were conducted on February 19, 2016 and on October 19, 2016. During the field survey biologists walked the length of the project alignment in meandering transects and recorded habitat characteristics that could promote occupancy by special-status species. An effort was made to obtain relevant information from as many parts of the assessment area as feasible, but surveyors did not attempt to attain 100% visual coverage. In addition to the assessment area, biologists surveyed a portion of Cayetano Creek north of Hartman Road and west of North Livermore Avenue. A portion of Arroyo Las Positas located south of Portola Avenue was also surveyed.

The following special-status species were observed during the field surveys conducted on February 19, 2016:

- One burrowing owl (*Athene cunicularia*) was observed along Cayetano Creek approximately 0.3 mile west of where the assessment area crosses North Livermore Avenue.
- One northern harrier (*Circus cyaneus)* was observed foraging over a field west of Dagnino Road approximately 500 feet west of the assessment area
- One white-tailed kite (*Elanus leucurus*) was observed foraging over a field west of the intersection of North Livermore Avenue and Hartman Road.

3.5 Species Considered for Analysis

The potential for wildlife species to occur within the assessment area was classified as high, moderate, low, or absent using the guidelines described below. Table 1 includes descriptions of the special-status wildlife species that were identified through research and database queries along with their potential to occur in the assessment area.

High: The potential for a species to occur was considered high when the project was located within the range of the species, recorded observations were identified within normal movement distance of the project, and suitable habitat was present within the project area.

Moderate: The potential for a species to occur was considered moderate when the project was located within the range of the species, recorded observations were identified nearby but outside

normal movement distance of the project, and habitat within the project area was suitable. Alternatively, the potential was classified as moderate when recorded observations were identified within normal movement distance of the project but habitat in the project area was limited or of marginal quality.

Low: The potential for a species to occur was considered low when the project was within the range of the species, but no recorded observations within normal movement distance were identified, and habitat within the project area was limited or of marginal quality. Alternatively, the potential was classified as low when the project was located at the edge of the range of a species and recorded observations were extremely rare, but habitat in the project area was suitable.

4.0 Environmental Setting

The 138.14-acre assessment area is located within the north Livermore Valley which is located approximately 20 miles east of San Francisco Bay, and is bordered to the east by the Diablo Range. The assessment area lies within the Tassajara, Byron Hot Springs, Livermore, and Altamont U.S. Geological Survey 7.5-minute quadrangle maps, and is located within Conservation Zone 4 of the East Alameda County Conservation Strategy (EACCS).

Land use within the assessment area is mainly agricultural and low-density residential, with cattle grazing and dry land farming in the form of hay production representing the primary land use in the area. Other adjacent uses include the managed mitigation ponds located on the east side of Dagnino Road, and Las Positas College, which is located about 0.5 mile west of the southern portion of the assessment area. Wildlife habitats within the assessment area and immediately surrounding areas are described below.

4.1 Non-Native Annual Grassland

Annual grassland represents the dominant vegetation type within the assessment area. This vegetation type is composed of non-native annual grasses and forbs, such as wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), and soft chess brome (*Bromus hordeaceous*). Most portions of the assessment area containing grassland are used for cattle grazing.

4.2 Dryland Farmed

Portions of the assessment area between Dagnino Road and May School Road as well as between North Livermore Avenue and Hartman Road are used for a combination of grazing and feed production. These areas are typically disked annually and therefore undergo a larger amount of disturbance when compared to other parcels used solely for grazing.

4.3 Aquatic

Three ephemeral drainages and five seasonal swales are present in the assessment area within cattle pastures, dry farmland, and grassland (Table 1). These consist of low-gradient features that contain water briefly following rain events. These areas may remain saturated for a longer period than the surrounding uplands. A series of concrete-lined ditches is also present near the northern terminus of the assessment area.

Cayetano Creek is an intermittent creek that flows south from its origin in Contra Costa County and crosses the assessment area south of Hartman Road. The portion of the creek that crosses the project alignment is channelized and lacks dense riparian vegetation, although a single blue oak (*Quercus douglasii*) is present within the assessment area south of Hartman Road. Downstream of the channelized portion and 0.35 miles from the assessment area, the creek begins to meander naturally as it passes through an area containing vernal pools upstream of its confluence with Arroyo Las Positas.

Roadside ditches located along the edges of roads within the assessment area may contain water for very brief periods following rain events. Roadside ditches are present along May School Road and North Livermore Avenue.

Although absent from the assessment area, vernal pools are present in the vicinity of the project. Northern Claypan vernal pools are present starting approximately 200 feet east of the assessment area on the opposite side of North Livermore Avenue, and farther south adjacent to Cayetano Creek about 0.25 miles southeast of the assessment area. Northern Claypan vernal pools are typically alkaline and may contain whitish salt deposits or scalds in unvegetated portions when dry. Vernal pools provide habitat for a large number of special status species. In the project region, these pools can be found on level stream terraces, including the area north of Cayetano Creek and the Springtown Preserve near Arroyo Las Positas. Many vernal pools are swales that are formed in part by the overflow of the adjacent creek and continue to hold water after the intermittent creek has dried. Vernal pools in the project region are typically on Solano fine sandy loam soil which is strongly alkaline and tends to form mounds or 'hogwallows'. The sizes of individual pools can range from a few square meters to several hectares. Vernal pools occur less than 100 feet from a project staging area on the opposite side of North Livermore Avenue as well as less than 1,000 feet from the project along Dagnino Road and south of the assessment area between North Livermore Avenue and Portola Avenue.

A summary of the ephemeral drainages and seasonal swales that occur within the assessment area is provided in Table 1.

Table 1. Aquatic Habitats within the Assessment Area

Name*	Type	Acreage
W-1	Ephemeral Drainage	0.021
W-2	Ephemeral Drainage	0.014
W-3	Seasonal Swale	0.099
W-4 (Cayetano Creek)	Ephemeral Drainage	0.014
W-5	Seasonal Swale	0.083
W-6	Seasonal Swale	0.197
W-7	Seasonal Swale	0.006
W-8	Seasonal Swale	0.003
Total		**0.44**

*Names correspond to Label in wetland delineation report

4.4 Disturbed / Developed

Disturbed or developed areas include paved or other hardscaped areas, graveled roads, structures, and landscaped areas. In the assessment area, developed areas include paved roads and residences

and associated outbuildings located along Dagnino Road and North Livermore Avenue, as well as a new residential apartment development currently under construction along Portola Avenue.

The acreage of each habitat type and its percentage of the total assessment area are shown in Table 2.

Table 2. Habitat Types within the Assessment Area

Habitat Type	Total Acres in Assessment Area	% of Total Area
Annual Grassland	57.00	41.3%
Dryland Farmed	77.70	56.3%
Swales, Creeks and Ditches	0.44	0.3%
Disturbed / Developed	3.00	2.2%
Total	**138.14**	**100%**

5.0 Results

A total of 40 special-status wildlife species were identified through the literature review and database queries as having the potential to occur in the assessment area (Table 3). The following section addresses 16 wildlife species that were determined to have a low, moderate, or high potential to occur. The complete list, including wildlife species determined to be absent from the assessment area and the rationale for that determination, are included in Table 3.

5.1 Special-Status Wildlife

California Tiger Salamander (*Ambystoma californiense*)

Federally Threatened
California Threatened
High Potential

The central population of the California tiger salamander (CTS) is listed as threatened under both federal (USFWS 2004) and California State endangered species legislation (FGC 2010). Critical habitat was designated in 2005 (USFWS 2005). The project is located outside of designated critical habitat for the species. The nearest critical habitat to the project area is Unit CV-18, located approximately 0.37 mile west of the access route leading to the southern part of the assessment area.

The CTS is strongly associated with grassland habitat but also occurs in other habitat types, including oak savanna, the edges of mixed woodlands, and foothill coniferous forests (Stebbins 2003). Adults spend most of the year in underground retreats, particularly in burrows of California ground squirrels (*Spermophilus beecheyi*) and pocket gopher (*Thomomys bottae*), and occasionally are found in man-made structures. CTS make seasonal migrations to breeding ponds starting with the onset of fall rains. Seasonal pools are most commonly used but CTS may also use permanent

ponds if predatory fish are absent. After breeding, CTS adults return to their upland retreats after a few days or weeks. Juveniles require approximately 10 weeks to achieve metamorphosis; then the juveniles disperse to upland areas after spending a few hours or days near the edge of aquatic habitats. CTS have been found using upland habitat up to 1.3 miles from breeding ponds (Orloff 2007).

The CNDDB contains 12 records of CTS within 1.3 miles of the assessment area (CNDDB 2016). The nearest consists of multiple observations of adults in 1992 and 1996-97 from an area containing grassland and seasonal wetlands mapped broadly by the CNDDB between North Livermore Avenue and Lorraine Avenue. This area is bounded on the south by I-580 and by May School Road on the north. The mima mound topography and seasonal wetlands associated with this record were absent from the assessment area but are visible on aerial imagery further to the south, notably south of Hartford Avenue, a distance of about 0.25 mile. Another nearby record of CTS consists of breeding ponds located within a mitigation preserve on the east side of Dagnino Road 0.2 mile east of the assessment area where larvae have been observed between 2003 and 2015. In addition, juvenile CTS were reported from a seasonal pool located near the southern portion of the alignment, 0.12 mile west of the assessment area in 1998. Other nearby records include individuals sighted in the early 1980's near Vasco Road 0.5 mile east of the northern terminus of the assessment area, ponds located on Los Vaqueros Reservoir property one mile to the north of the alignment where breeding has been observed at least as recently as 2013, and breeding pools within the Springtown Preserve, located about 0.7 miles east of the assessment area which contains CNDDB records of CTS breeding from 1991 to 1999.

No aquatic habitats suitable for breeding are present within the assessment area, however, all of the assessment area is within 1.3 miles of documented breeding records of the CTS, and the grassland and dryland farm fields found throughout most of the assessment area provide, at minimum, suitable dispersal habitat for the species. Suitable upland habitat containing underground burrows likely to be occupied for CTS is less abundant and is concentrated primarily in grassland areas where soils are friable and ground squirrel populations have not been eliminated by repeated tillage as described below.

CTS Upland Habitat

Suitable CTS upland habitat is present in portions of the assessment area that contain grazed or ungrazed grasslands that are not subject to regular ground disturbance. The northern portion of the assessment area (north of Dagnino Road) consists of annual grassland cattle pastures that contain small mammal burrows suitable for use by CTS. Other areas with suitable CTS upland habitat include the northern portion of the fields immediately south of May School Road, and most of the fields located south of Hartman Road and north of Portola Avenue. Small mammal burrows are present but are relatively sparse throughout most of these areas. The uplands immediately north of Cayetano Creek for about 500 feet within the assessment area contain colonies of ground squirrels, and other ground squirrel colonies are present in the fields farther south. One field that overlaps with the assessment area from the staging area north of Portola Avenue for about 0.25-mile formerly contained grassland but had recently been tilled in 2016 for what appeared to be the first time in several years based on aerial imagery. The portion of the field over the existing pipeline was not tilled however, so at least a portion of the upland habitat

in that area was unaffected. Ground squirrel activity was present in that area as well during field surveys.

Dryland Farmed Fields

Dryland farmed fields occur from Dagnino Road south to May School Road as well as on both sides of North Livermore Avenue to Hartman Road. A portion of the area south of Hartman Road may be in the process of conversion to dryland farming, except for a corridor over the pipeline that was left intact.

In general, areas subject to intensive agricultural activities (e.g. vineyards, row crops, orchards) are unsuitable as CTS uplands and provide only dispersal habitat for the species. Less intensive agricultural activities such as dryland farming in which land is ripped or disked periodically can also negatively affect CTS habitat by eliminating rodent burrows or reducing small mammal populations to the point that insufficient underground refugia are present. In most of the dryland farmed fields within the assessment area, rodent burrows were absent or if present, occurred in very low numbers. This is consistent with the impacts commonly associated with disking or deep-ripping of rangeland for conversion to agriculture which can destroy CTS upland habitat, and causes direct mortality to salamanders occupying the habitat (USFWS 2015). Dry farmland can still function as CTS dispersal habitat if small mammal burrows are absent; however, the suitability of fields as dispersal habitat also can be limited by the deep soil furrows and tall grasses and forbs associated with dryland farming.

California Red-Legged Frog (*Rana draytonii*)

Federally Threatened
State Species of Special Concern
High potential during the rainy season, during rain events, and periods of high humidity; otherwise Moderate potential

The California red-legged frog (CRLF) is listed as federally threatened (USFWS 1996) and is considered a Species of Special Concern by CDFW. Critical habitat was designated in 2010 (USFWS 2010a).

The CRLF breeds in wetlands, lakes, ponds, and other still or slow-moving sources of water that remain inundated long enough for larvae to complete metamorphosis, which typically occurs from 11–20 weeks after hatching (Storer 1925). During summer months, CRLF may take refuge in cool, moist areas, including rodent burrows and soil crevices within a few hundred feet of aquatic habitats. Adult CRLF tend to be most active at night during wet weather, but they may move through upland areas at any time during the year (USFWS 2002). CRLF may disperse over two miles from breeding ponds but movement distances of up to one mile probably occur much more commonly.

The CNDDB contains thirteen records of CRLF within one mile of the assessment area. The nearest records of CRLF are from 1996-1997 and are associated with the complex of grassland

and seasonal wetlands between I-580, North Livermore Avenue, May School Road, and Lorraine Avenue which overlaps a portion of the project alignment. Other nearby observations include a breeding record from 1999 along the portion of Cayetano Creek extending from its confluence with Las Positas Creek to a point on the west side of North Livermore Avenue about 0.2 mile east of the assessment area. An additional record near the southern portion of the alignment by the entrance to Las Positas College has possibly been extirpated (CNDDB 2016). Farther to the north there are several records of CRLF from stock ponds and also from the Lin Livermore Preserve on the east side of Dagnino Road from 2005 to 2014. The nearest one of these is within about 0.2 mile of the assessment area. Several additional records found between 1980 and 2014 along Vasco Road and the Los Vaqueros Watershed are less than one mile from the northern part of the assessment area.

The northern portion of the assessment area is located within designated critical habitat for the CRLF. Approximately 18.5 acres of the project footprint, excluding paved and graveled roads, is within Unit CCS-2, Mount Diablo. The project overlaps with Subunit CCS-2B which consists of over 44,000 acres of public and private land and contains some of the highest concentrations of CRLF and CRLF habitat (USFWS 2010a).

CRLF Aquatic Habitat

Aquatic breeding habitat for CRLF consists of still or slow-moving freshwater habitats that become inundated during winter rains and hold water for a minimum of 20 weeks during all but the driest of years. Aquatic breeding habitat for the CRLF is absent from the assessment area. The project crosses only one creek (Cayetano Creek) and no other aquatic features are present that could contain water long enough to support CRLF breeding and metamorphosis. Other aquatic habitats including roadside ditches along May School Road and North Livermore Avenue, and drainage swales through pastures contain water only briefly after rain events. Within the assessment area Cayetano Creek is channelized and when water is present it flows too swiftly to be suitable for CRLF breeding. Un-channelized portions of Cayetano Creek where CRLF breeding has been observed are present about 0.35 mile east of the assessment area.

Aquatic non-breeding habitats include freshwater streams and ponds that are suitable for use by CRLF for shelter, foraging, predator avoidance and movement of juvenile and adult frogs but that are unsuitable for breeding due to high flow rates or an insufficient hydroperiod. Non-breeding aquatic habitat occurs in the assessment area only during and immediately after periods of wet weather, and no high quality non-breeding aquatic habitat is present. Within the assessment area Cayetano Creek is intermittent, and typically does not contain water outside of the CRLF breeding season that would provide non-breeding aquatic habitat. The channelized portion that crosses the assessment area has a relatively flat, earthen substrate and does not form deep pools suitable for use by CRLF. During and immediately after rain events Cayetano Creek, swales and even roadside ditches could provide temporary aquatic habitat for CRLF, particularly for dispersing juveniles which are more likely than adult frogs to use suboptimal habitats, but in general this habitat type is absent from the assessment area.

CRLF Upland Habitat

CRLF upland habitat provides food and shelter sites that are accessible from aquatic or riparian habitat areas. CRLF upland habitat includes areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of one mile in most cases, depending on surrounding landscape and dispersal barriers (USFWS 2010a). Upland habitat includes various vegetation types, such as grassland, woodland, forest, wetland, or riparian areas and includes structures that provide shade, moisture and cooler temperatures; these structures can be natural or man-made and include spaces under boulders or rocks, downed trees or logs, construction debris, agricultural structures (such as watering troughs, spring boxes, abandoned sheds, and hay stacks) as well as small mammal burrows and moist leaf litter (USFWS 2010a).

Upland habitats suitable for use by CRLF occur throughout the assessment area and mainly include areas of non-native annual grasslands and dry farmland (typically planted with mixed forbs). Most of the annual grasslands in the assessment area are grazed by cattle throughout the year and the dry (non-irrigated) farmland is tilled and planted in the fall. Other CRLF upland habitats include dense vegetation, surface objects, and seasonally dry drainages and wetlands.

Seasonal drainages and the areas immediately surrounding them may provide suitable upland habitat when vegetation or upland retreats are present. Rodent burrows and soil crevices within the channel or banks of drainages may contain moisture for a longer period of time than burrows located in grasslands or dryland farm fields and may provide suitable CRLF upland habitat. Within the assessment area grasslands and dryland farm fields located more than a few hundred feet from aquatic or riparian habitat where cover is limited to grasses and rodent burrows are unlikely to be used by CRLF as upland habitat.

Dispersal Habitat

Areas that provide connectivity between CRLF breeding and upland or non-breeding aquatic habitats are considered dispersal habitat. These can include a wide variety of habitat types that are free of barriers to movement such as heavily traveled roads without bridges or culverts, moderate- to high-density urban or industrial developments, and large lakes and reservoirs (USFWS 2010a). CRLF have been documented to travel over two miles between aquatic breeding and non-breeding sites (Bulger et al. 2003) but the dispersal distance of CRLF is heavily influenced by habitat availability and site-specific conditions, and in many cases frogs appear to disperse from breeding ponds only as far as the closest suitable upland habitat (Fellers and Kleeman 2007). The U.S. Fish and Wildlife Service (2010a) defines designated dispersal habitat as upland or riparian habitat within and between currently or previously occupied sites that are located within one mile of one another. Agricultural lands and other altered habitats can function as dispersal habitat if movement is not precluded by barriers.

During periods of heavy rain the entire landscape within the assessment area may become suitable for CRLF dispersal, but during most other times CRLF are likely to use areas containing moisture, vegetation and cover for dispersal habitat. Within the assessment area CRLF are probably most likely to use habitat along Cayetano Creek, the drainage swales that cross the project alignment, and in the upland areas at the southern end of the project near Arroyo Las Positas for dispersal. CRLF may also occasionally use the dryland farm fields near the Lin Livermore Preserve to

disperse from breeding ponds to surrounding drainages including an ephemeral drainage located on the west side of the assessment area.

In general, although aquatic sites occupied by CRLF are present nearby, habitats within the assessment area itself do not provide high-quality CRLF habitat. CRLF may occasionally use portions of the assessment area as upland and dispersal habitat, particularly in the vicinity of creeks and drainages, and in portions of the assessment area that are close to breeding ponds in the Lin Livermore Preserve.

Western Spadefoot Toad (*Spea hammondii*)

California Species of Special Concern
Low Potential

The western spadefoot toad is designated as a California Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2008). It inhabits primarily lowland areas where temporary pools occur, including washes, river floodplains, alluvial fans, and alkali flats. The western spadefoot is associated with areas of having low vegetation and where the soil is sandy or gravelly. It is found in the Central Valley and Sierra foothills, as well as the Coast ranges north and south of San Francisco Bay. Spadefoot toads spend much of the year in aestivation in burrows that are either self-made or constructed by gophers, squirrels or kangaroo rats.

The nearest recorded observations of western spadefoot toad are from 2004 at the Lawrence Livermore National Laboratory, approximately five miles southeast of the assessment area. Potential breeding habitat is present outside of the assessment area in vernal pools in the project vicinity, however the clay soils found throughout the majority of the assessment area provide marginal habitat for the species. There is a low potential to encounter the western spadefoot within the assessment area.

Western Pond Turtle (*Actinemys marmorata*)

California Species of Special Concern
Low Potential

The western pond turtle is designated as a species of special concern by CDFW. It is a highly aquatic turtle that inhabits ponds, lakes, rivers, streams and marshes. It requires sites for basking and upland habitat for egg-laying such as sandy or grassy open fields. Diet includes aquatic invertebrates such as insects and crayfish as well as fish, carrion and plant material. Females may travel up to 0.5 mile from water to deposit eggs, although shorter movements are more typical.

The nearest recorded observations of western pond turtle are from Las Positas Creek where turtles have been observed in 2003 and 2008, approximately 1.3 miles southeast of the assessment area. Other ponds in the project vicinity may support western pond turtle, however the ponds we identified on aerial imagery within 0.5 mile of the assessment area appear to lack permanent water. Within the assessment area, Cayetano Creek may contain sufficient water to provide habitat during

periods of high flow on a temporary basis. No other suitable aquatic habitat is present within the assessment area. Due to the distance of the assessment area from permanent water, there is a low potential for the western pond turtle to occur.

Alameda Striped Racer (*Coluber lateralis euryxanthus*)

Federally Threatened
California Threatened
Low Potential

The Alameda striped racer is listed as threatened under both federal (USFWS 1997) and California state endangered species legislation. Critical habitat was designated in 2006 (USFWS 2006). The assessment area is located outside of critical habitat for the ASR, and the nearest critical habitat is Unit 4, located 5.5 miles to the northwest.

The ASR is most frequently found in chaparral, Diablan sage scrub, northern coyote brush scrub, and riparian scrub, but also uses the mosaic of adjacent habitats in Alameda and Contra Costa Counties, including oak woodland, grassland (grazed and ungrazed), riparian, and even mixed evergreen forest. Swaim (1994) found that the home ranges of six radio-telemetry transmitter-equipped ASR were centered within scrub communities, and habitat use was concentrated into core areas that consisted of open or partially open canopy scrub on east, southeast, south, and southwest facing slopes, or in nearby grassland habitats that were within a few hundred feet of scrub with similar aspects. Rock outcrops were also typically abundant in core areas at the two sites where radio telemetry was used. Rock outcrops provide protective cover and are associated with high densities of lizards, a major prey item of the ASR (Swaim 1994).

The nearest record of ASR to the assessment area is from the Los Vaqueros Reservoir watershed property, approximately 1.4 miles to the north. Other nearby records include multiple individuals observed along Morgan Territory Road, about 2.25 miles to the northwest. Although these records are within the maximum dispersal ability of the species, the open grassland habitat within the assessment area provides relatively low quality for the species and the likelihood of encountering ASR in the assessment area is low.

Burrowing Owl (*Athene cunicularia*)

California Species of Special Concern
High Potential

The burrowing owl is designated by CDFW as a Species of Special Concern. Burrowing owls are found in open arid and semiarid habitats with short or sparse vegetation, including grasslands, deserts, agricultural fields, ruderal areas and open, landscaped areas. They are dependent on mammals such as the California ground squirrel that dig underground burrows, which the owls occupy. Some burrowing owls have adapted to urban landscapes, and in some instances open lots, roadsides, and landscaped areas can provide suitable habitat. Breeding typically occurs from March to August but can begin as early as February and can last into December.

The CNDDB contains four records of burrowing owls within a one-mile radius of the assessment area. The nearest observation is from an area east of North Livermore Avenue, north of Hartford Road, where multiple nesting pairs were observed in 1997, about 350 feet from the assessment area. Other records are known from the mitigation lands on the east side of Dagnino Road, less than one mile from the assessment area. During the field survey on February 19, 2016 biologists observed a burrowing owl along a portion of Cayetano Creek and 0.3 mile outside and west of the assessment area. Evidence of burrow use by burrowing owls (i.e. whitewash and prey remains) also was observed within the assessment area approximately midway between Cayetano Creek and Portola Avenue, although burrowing owls were not observed in the area during field surveys.

Habitat within the assessment area is suitable for use by burrowing owls and there is a high potential for the species to occur, particularly in areas with high concentrations of ground squirrel burrows. Burrows suitable for use by burrowing owl are present at various locations within the assessment area and burrowing owls may forage throughout the assessment area.

Golden Eagle (*Aquila chrysaetos*)

California Fully Protected
Low Potential (Nesting and Wintering)

The golden eagle is listed as a fully protected species under the California Fish and Game Code. Golden eagles occur in grasslands, oak savannahs, woodlands, and agricultural areas. Nesting habitat includes cliffs and large trees in open or semi-open areas, and golden eagles frequently use the same nesting sites between years or use alternate sites within a territory. Golden eagles prey on mammals such as jackrabbits (*Lepus californicus*) or ground squirrels.

The CNDDB contains five records of golden eagles within a five-mile radius of the assessment area. The nearest records are from the Los Vaqueros Reservoir watershed lands between two and 2.5 miles north of the assessment area. Other records include golden eagle observations north of Brushy Peak Preserve and additional nesting observations from around Los Vaqueros Reservoir.

Golden eagle foraging habitat is present throughout the assessment area, particularly where small mammals are abundant. Suitable nesting habitat is present in a few areas where large trees occur within open grassland areas, however, the likelihood of golden eagles nesting in these areas is limited by their proximity to public roads and associated disturbances as well as other human activities.

Short-Eared Owl (*Asio flammeus*)

California Species of Special Concern
Low Potential

The short-eared owl is designated as a Species of Special Concern by CDFW. It is a year-round resident in portions of California but is typically a migratory species. In California, short-eared owls are most numerous in winter, and migrating owls generally arrive in September and October, and begin to depart in April (Zeiner et. al. 1990). Habitat includes meadows, wetlands,

and agricultural fields. Short-eared owls build nests in shallow depressions within tall stands of grasses near foraging habitat.

The nearest CNDDB record is just over 11 miles to the east, at the Lawrence Livermore National Laboratory Site 300 where a nesting pair and three juveniles were reported in 1995 (CNDDB 2016).

Foraging habitat for the short-eared owl within the assessment area is suitable and small mammal prey items are present. The vernal swale habitat along Cayetano Creek and the wetlands within the Lin Livermore Preserve outside of the assessment area may provide marginal nesting habitat for the species, however marshes and wet meadows with high densities of California voles (*Microtus californicus*) are absent from the assessment area. The likelihood of encountering this species is considered to be low.

Northern Harrier (*Circus cyaneus*)

California Species of Special Concern
Low Potential (Nesting)

The northern harrier is designated as a Species of Special Concern by CDFW. Northern harriers primarily use wetlands for nesting where they build nests either on the ground or atop a mound of sticks, usually surrounded by dense vegetation. Harriers also nest in some types of agricultural fields and pasturelands. Northern harriers forage in a variety of open habitats including grasslands and agricultural areas.

The CNDDB contains one nesting record of northern harrier within five miles of the assessment area. This record is located in Tassajara Valley, just under five miles to the west. Additionally, a single northern harrier was observed flying approximately 500 feet to the west of the assessment area during the field survey conducted on February 19, 2016.

Suitable foraging habitat for the northern harrier is present throughout the assessment area. The potential for nesting to occur is low due to a limited amount of suitable nesting habitat.

White-tailed Kite (*Elanus leucurus*)

California Fully Protected
Low Potential

The white-tailed kite is listed as Fully Protected under the California Fish and Game Code. It inhabits grasslands, marshes, agricultural areas, oak woodland, and oak savanna habitats, typically nesting in dense-canopied trees. Small mammals, particularly meadow voles, make up the bulk of their diet, and foraging habitats are generally open areas supporting relatively large vole populations. Reptiles and occasionally birds are also taken as prey.

The CNDDB contains two nesting records of white-tailed kite within five miles of the assessment area. Both of these are from the Lawrence Livermore National Laboratory area where nesting was

observed in non-native pine and eucalyptus trees. A nesting record just over five miles to the east was reported from a coast live oak (*Quercus agrifolia*) tree within grazed or dry farmed land in Tassajara Valley.

Within the assessment area suitable nesting habitat for the white-tailed kite is absent but the stands of non-native eucalyptus trees west of Dagnino Road and north of May School Road located outside of the assessment area provide potential nesting habitat. Suitable foraging habitat for white tailed kite is present throughout the assessment area.

Loggerhead Shrike (*Lanius ludovicianus*)

California Species of Special Concern
Low Potential

The loggerhead shrike is designated a California Species of Special Concern by CDFW. Habitat includes open, grassy areas interspersed with trees, shrubs and bare ground. Compared to most birds, its head is large in proportion to its body size, lending to its name. It eats a wide variety of vertebrates and invertebrates, and is known to impale its prey on thorns or barbed-wire for ease of consumption. Throughout most of the southern part of its range it is resident while northern populations are migratory (Yosef 1996). Where resident, this species usually lives in pairs on permanent territories. Trees, shrubs, and fence posts are used as hunting perches and territory announcement sites. Nesting occurs in a variety of trees and shrubs but low shrubs with dense layers of protective branches or thorns are common. Despite its wide distribution, it is one of the few North American passerines whose populations have declined continent-wide in recent decades. Changes in human land-use practices, the spraying of biocides, and competition with species that are more tolerant of human-induced changes appear to be major factors contributing to this decline (Yosef 1996).

The nearest recorded observations of loggerhead shrike are from the Lawrence Livermore National Laboratory area, approximately five miles southeast of the assessment area where several nesting territories were detected in 2009. No other records are present within five miles of the assessment area. Foraging habitat is abundant within the assessment area but dense trees or shrub vegetation for nesting is relatively scarce. There is therefore a low potential for loggerhead shrike to nest within the assessment area.

Grasshopper Sparrow (*Ammodramus savannarum*)

California Species of Special Concern
High Potential

The grasshopper sparrow is designated a California Species of Special Concern by CDFW. It inhabits grassland habitats including cultivated fields with short to medium height vegetation consisting of grasses and scattered shrubs or weeds. The grasshopper sparrow builds a cup nest of dried grass located in slight depressions with overhanging grasses and forbs. Its diet consists primarily of invertebrates but also includes seeds from grasses and forbs.

The CNDDB contains one record of the grasshopper sparrow from the Lin Livermore Preserve located on Dagnino Road, 0.3 mile east of the assessment area. This record consists of an observation of a singing male and presumed pair of grasshopper sparrows foraging within the preserve in 2016. No other records are present within 10 miles of the assessment area.

Grassland and dry farmland habitats within the assessment area are suitable for foraging and nesting by grasshopper sparrows and a nearby CNDDB record of a pair and courtship behavior suggests that the species is present in the project vicinity. Due to the presence of suitable habitat onsite and nearby recorded observations there is a high potential for the grasshopper sparrow to occur within the assessment area.

American Badger (*Taxidea taxus*)

California Species of Special Concern
Moderate Potential

The American badger inhabits a variety of habitat types including scrub, forest, grasslands, and desert. It requires friable soils for burrowing and an adequate prey base. Badgers are fossorial and commonly prey on ground squirrels and gophers (*Thomomys bottae*). Badgers tend to be nocturnal but may occasionally be seen during the day, particularly in areas where human disturbance is minimal. Their long claws are highly adapted to digging and typically enlarge burrows constructed by other animals for dens.

The CNDDB contains two records of American badger within five miles of the assessment area. The nearest record is from an individual found dead along Vasco Road in 1995 less than one mile north of the northern end of the assessment area. Another record in the vicinity is from 1992, located 4.7 miles to the west of the assessment area along Tassajara Road, north of Pleasanton.

Habitat within portions of the assessment area for the American badger is suitable, particularly in areas where colonies of ground squirrel are present, such as north of Dagnino Road and south of Hartman Road. One burrow large enough to be used by badgers was observed within the assessment area, north of Portola Avenue during surveys. There is a moderate potential for this species to occur in the assessment area.

San Joaquin Kit Fox (*Vulpes macrotis mutica*)

Federally Endangered
California Threatened
Low Potential

The San Joaquin kit fox (SJKF) is listed as federally endangered (USFWS 1967) and state threatened. Kit foxes are typically associated with arid lands with sparse or absent shrub cover, sparse ground cover, and short vegetation. They construct underground burrows and tend to occur in areas with sandy soils that are relatively stone-free to several feet below the surface. They are primarily nocturnal and are active throughout the year. Burrows suitable for use by SJKF are

generally at least four to five inches in diameter at the surface and extend at least two feet below the surface without narrowing below four inches. Critical habitat has not been designated for the SJKF.

Of the more than 30 recorded observations of SJKF that occur within a 10-mile radius of the assessment area, the majority occurs on the east (opposite) side of Vasco Road, and none of the observations were recorded within the past 10 years (CNDDB 2016). The nearest and most recent record of SJKF was recorded in 2002 from the Brush Peak Regional Preserve, located on the east side of Vasco Road, about 2.5 miles east of the assessment area. Other nearby records include a natal den observed in 1989 in the vicinity to Morgan Territory Road, approximately the same distance north of the project, and several observations from between 1967 and 1989 southwest of Byron, approximately four miles northeast of the project.

One burrow large enough to be used by SJKF were observed in the assessment area during the field survey and the grassland habitats found in the project area are suitable for use by SJKF. However, the project is located at the extreme northern extent of the range of the SJKF and its current status in the northern Livermore Valley is unclear, therefore it is considered to have a low potential to occur.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*)

California Threatened
California Species of Special Concern
Low Potential

Townsend's big-eared bat is listed as state threatened and a California species of special concern. This species is found throughout California in a wide variety of habitats, including forested regions and buildings, and in areas with a mosaic of woodland, grassland, and/or shrubland. This species will roost in caves, buildings, and tree cavities and will hibernate in buildings in California. It is extremely sensitive to human disturbance.

The nearest records of Townsend's big-eared bat are located just over five miles from the project area and include a maternity roost located in a wine cave southeast of Livermore that was active in 2009, and a solitary male found in a barn in Pleasanton in 2012 (CNDDB 2016).

An apparently abandoned home located approximately 60 feet from an access route to the northern most section of the project area may provide suitable roosting habitat. In general, abandoned wooden homes may have suitable thermal conditions for multiple bat species' different life stages at various locations within the structure.

Pallid Bat (*Antrozous pallidus*)

California Species of Special Concern
Low Potential

The pallid bat is listed as a California species of special concern. It is frequently associated with desert areas but also occur in coniferous forests, non-coniferous woodlands, brushy terrain, rocky canyons, open farm land, and coast redwoods. This species commonly roosts in rock crevices, old buildings, bridges, caves, mines, hollow trees, and bridges.

There are no occurrences of pallid bat near the project area, and the nearest records are from along the Arroyo Mocho approximately 7.5 miles southeast of the assessment area where multiple individuals were collected in 1942 and 1945 (CNDDB 2016). An apparently abandoned home located approximately 60 feet from an access route to the northern most section of the project area may provide suitable roosting habitat. In general, abandoned wooden homes may have suitable thermal conditions for multiple bat species' different life stages at various locations within the structure.

6.0 Recommended Avoidance and Minimization Measures

The following measures are recommended to avoid and/or minimize the risk of potential impacts to special-status species and their habitats during project activities. These are based on measures recommended by the East Alameda County Conservation Strategy (EACCS) and have been modified as appropriate for the proposed project. General measures and species-specific measures for special-status species with potential to occur in the assessment area are included.

General Measures

Biological Monitor	A qualified biological monitor will remain on-site during all construction activities in or adjacent to habitat for listed species. The biological monitor(s) will be given the authority to stop any work that may result in the take of listed species. The biological monitor will be the contact for any employee or contractor who might inadvertently kill or injure a listed species or anyone who finds a dead, injured or entrapped individual.
Worker Awareness Education Program	Prior to construction, a construction employee education program will be conducted in reference to potential listed species on site. At minimum, the program will consist of a brief presentation by persons knowledgeable in endangered species biology and legislative to explain concerns to contractors, their employees, and agency personnel involved in the project. The program will include: a description of the species and their habitat needs; any reports of occurrences in the project area; an explanation of the status of each listed species and their protection under the Act; and a list of measures being taken to reduce effects to the species during construction and implementation. Fact sheets conveying this information and an educational brochure containing color photographs of all listed species in the work area(s) will be prepared for distribution to the above-mentioned people and anyone else who

	may enter the project area. A list of employees who attend the training sessions will be maintained. Contractor training will be incorporated into construction contracts and will be a component of weekly project meetings.
Preconstruction Surveys	Preconstruction surveys for listed species will be performed immediately prior to groundbreaking activities. Surveys will be conducted by qualified biologists. If at any point, construction activities cease for more than five consecutive days, additional preconstruction surveys will be conducted prior to the resumption of construction.
Excavations and Trenches	To prevent the accidental entrapment of listed species during construction, all excavated holes or trenches deeper than 6 inches will be covered at the end of each work day with plywood or similar materials. Foundation trenches or larger excavations that cannot easily be covered will be ramped at the end of the work day to allow trapped animals an escape method. Prior to the filling of such holes, these areas will be thoroughly inspected for listed species by a qualified biologist. Trenches will be backfilled as soon as possible.
Special-Status Wildlife Relocation	A listed-species relocation plan will be prepared for the project and submitted for approval to the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife prior to any relocation of listed species.
Trash and Debris	All trash and debris within the work area will be placed in containers with secure lids before the end of each work day in order to reduce the likelihood of predators being attracted to the site by discarded food wrappers and other rubbish that may be left on-site. Containers will be emptied as necessary to prevent trash overflow onto the site and all rubbish will be disposed of at an appropriate off-site location.
Vegetation Removal	All vegetation which obscures the observation of wildlife movement within the affected areas containing or immediately adjacent to aquatic habitats will be completely removed using hand tools just prior to the initiation of grading to remove cover that might be used by listed species. A qualified biologist will survey these areas immediately prior to vegetation removal to find, capture and relocate any observed listed species, in accordance with the relocation plan.
Nighttime Work	To the maximum extent feasible, all construction activities will cease one half hour before sunset and will not begin prior to one half hour after sunrise. If nighttime construction cannot be avoided, night work will be limited to a maximum of seven (7) nights and will be

	limited in extent, duration, and brightness to the maximum extent feasible. Lighting will be faced downward and will only be utilized in the immediate workspace. A qualified biologist will be present during all construction activities including all night work.
Weather	Grading and construction will be limited to the dry season and periods of dry weather to the maximum extent feasible.
Stormwater Control	Best Management Practices (BMPs) will be used to minimize erosion and impacts to water quality and effects to aquatic habitat. If necessary, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared.
Delineation Fencing	The construction area shall be delineated with high visibility temporary fencing at least 4 feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment outside of the construction area Such fencing shall be inspected and maintained daily until completion of the project. The fencing will be removed only when all construction equipment is removed from the site.
Wildlife Exclusion Fencing	Silt fencing or wildlife exclusion fencing will be used to prevent listed species from entering the project area Exclusion fencing will be at least 3 feet high and the lower 6 inches of the fence will be buried in the ground to prevent animals from crawling under. The remaining 2.5 feet will be left above ground to serve as a barrier for animals moving on the ground surface. The fence will be pulled taut at each support to prevent folds or snags. Fencing shall be installed and maintained in good condition during all construction activities. Such fencing shall be inspected and maintained daily until completion of the project. The fencing will be removed only when all construction equipment is removed from the site.
Invasive Plants	A qualified biologist shall ensure that the spread or introduction of invasive exotic plant species shall be avoided to the maximum extent possible. When practicable, invasive exotic plants in the project areas shall be removed.
Vegetation Restoration Plan	Project sites shall be re-vegetated with an appropriate assemblage of vegetation suitable for the area. A species list and restoration and monitoring plan shall be included with the project proposal for review and approval by the Service and CDFW. Such a plan will include, but not be limited to, location of the restoration, species to be used, restoration techniques, time of year the work will be done, identifiable success criteria for completion, and remedial actions if the success criteria are not achieved. To discourage the introduction

	and establishment of invasive plant species, seed mixtures/straw used within natural vegetation will be either rice straw or weed-free straw.
Dewatering	If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters. If flowing water is present during construction, water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.
Non-Native Species Removal	A qualified biologist shall permanently remove, from within the project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. The applicant shall have the responsibility to ensure that their activities are incompliance with the California Fish and Game Code.
Trash, Firearms, Open Fires, and Pets	The following will not be allowed at or near work sites for covered activities: trash dumping, firearms, open fires (such as barbecues) not required by the activity, hunting, and pets.
Vehicle Parking and Off-Road Travel	Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas to the extent practicable. Off-road vehicle travel will be minimized.
Vehicle Speed Limit	Vehicles will not exceed a speed limit of 15 mph on unpaved roads within natural land-cover types, or during off-road travel.
Refueling	Vehicles or equipment will not be refueled within 100 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area is constructed.
Vehicle Washing	Vehicles shall be washed only at approved areas. No washing of vehicles shall occur at job sites.
Pipes and Culverts	Pipes, culverts and similar materials greater than four inches in diameter, will be stored so as to prevent covered wildlife species from using these as temporary refuges, and these materials will be inspected each morning for the presence of animals prior to being moved.
Erosion Control Materials	Erosion control measures will be implemented to reduce sedimentation in wetland habitat occupied by covered animal and plant species when activities are the source of potential erosion problems. Plastic mono-filament netting (erosion control matting) or

	similar material containing netting shall not be used at the project. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.
Soil Stockpiling	Stockpiling of material will occur such that direct effects to covered species are avoided. Stockpiling of material will not occur in creeks, drainages, or wetland areas.
Grading	Grading will be restricted to the minimum area necessary.
Wetland Disturbance	Significant earth moving-activities will not be conducted in wetland areas within 24 hours of predicted storms or after major storms (defined as 1-inch of rain or more).

Species-Specific Measures

Nesting Birds

- Construction activities, including vegetation and tree removal, shall be conducted outside of the bird nesting season (February 1 to August 30), to the extent feasible.
- If construction will occur during the bird nesting season, a qualified wildlife biologist shall conduct pre-construction surveys within 7 days of the start of construction or after any construction breaks of 14 days or more to identify active nests. A nest is defined to be active for raptors if a pair of raptors is displaying reproductive behavior (i.e., courting) at the nest and/or if the nest contains eggs or chicks. Surveys shall be conducted for the nesting birds and suitable habitat within 100 feet of the proposed project sites to locate any active passerine nests, and within 300 feet of the proposed project sites to locate any active raptor nests.
- If active nests are located during the pre-construction bird nesting survey, the wildlife biologist shall evaluate whether the schedule of construction activities could affect the active nest and the following measures shall be implemented based on their determination:
- Construction determined not likely to affect the active nest may proceed without restriction; however, the wildlife biologist shall regularly monitor the nest to confirm that there is no adverse effect, and may revise their determination at any time during the nesting season.
- If construction may affect the active nest, the biologist shall establish a no-disturbance buffer. The biologist shall determine the appropriate buffer to be in compliance with the Migratory Bird Treaty Act and Fish and Game Code 3503,

taking into account the species involved, the presence of any obstruction—such as a building—within line-of-sight between the nest and construction, and the level of project and ambient activity (i.e., adjacent to a road or active trail). No-disturbance buffers for passerines typically vary from 25 feet and greater, and for raptors from 300 feet and greater. Active nests shall be monitored and exclusion buffer sizes increased if the monitoring biologist determines this is necessary based on disturbance behavior exhibited by nesting birds in proximity to project construction. For bird species that are federally and/or state-listed sensitive species (i.e., threatened, endangered, fully protected, or species of special concern), a PG&E representative, supported by the wildlife biologist, shall consult with the USFWS and/or CDFW regarding nest buffers.

  - Inactive passerine nests may be removed at any time, but inactive raptor nests shall not be removed unless approved by the USFWS and/or CDFW.
  - Removing or relocating active nests shall be coordinated by the PG&E representative with the USFWS/and or CDFW, as appropriate, given the nests that are found at the site.

Western Burrowing Owl

- If an active nest is identified near a proposed work area work will be conducted outside of the nesting season (March 15 to September 1) to the extent feasible.
- If an active nest is identified near a proposed work area and work cannot be conducted outside of the nesting season, a no-activity zone will be established by a qualified biologist. The no-activity zone will be large enough to avoid nest abandonment and will at a minimum be 250-feet radius from the nest.
- If burrowing owls are present at the site during the non-breeding period, a qualified biologist will establish a no-activity zone of at least 150 feet.
- If an effective no-activity zone cannot be established in either case, an experienced burrowing owl biologist will develop a site-specific plan (i.e., a plan that considers the type and extent of the proposed activity, the duration and timing of the activity, the sensitivity and habituation of the owls, and the dissimilarity of the proposed activity with background activities) to minimize the potential to affect the reproductive success of the owls.

California Tiger Salamander and California Red-Legged Frog

- The portions of Cayetano Creek and any wetlands within the project corridor or staging areas that will not be impacted by the project will be marked with orange construction fencing and erosion control fencing and will be avoided during project activities. Exclusion zones will be designated around all aquatic habitats onsite that will not be subject to project impacts. The area within 50 feet of Arroyo Las Positas and outside of the work area will be designated as environmentally sensitive and will be flagged for avoidance during project activities
- A qualified biologist will conduct preconstruction surveys prior to activities define a time for the surveys (before ground breaking). If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFG approved relocation site.
- A qualified biologist will be present for initial ground disturbing activities.
- Barrier fencing will be constructed around the worksite to prevent amphibians from entering the work area. Barrier fencing will be removed within 72 hours of completion of work.
- No monofilament plastic will be used for erosion control.
- Construction personnel will inspect open trenches in the morning and evening for trapped amphibians.
- Work will be avoided within suitable habitat to the maximum extent feasible.

7.0 Conclusions

The results of this analysis indicate that 16 species of special-status wildlife may constrain project activities as a result of having potential to occur in the assessment area. The likelihood of impacts can be reduced by implementing the conservation measures described under Section 6 of this report.

Special status wildlife that were identified as having the highest potential to occur in the project area were the CTS, CRLF, burrowing owl, and the grasshopper sparrow. The likelihood of encountering CRLF can be reduced by minimizing or avoiding project activities during periods of wet weather and by implementing other protection measures, as feasible. Avoiding work during rain events also will also help to reduce the likelihood of encountering migrating CTS, although individuals may be encountered in subterranean burrows or soil crevices at any time during the year. Protection measures for CTS and CRLF in conjunction with other measures will

help to avoid impacts to other special-status reptiles and amphibians including the western spadefoot and Alameda striped racer.

There is a high potential for burrowing owls to nest within or near the assessment area, particularly within ground squirrel burrows in the southern half of the alignment. If determined to be present, a plan for avoiding impacts to nesting burrowing owls should be developed prior to the start of construction.

Impacts to nesting birds, including the grasshopper sparrow, can be avoided by conducting appropriately-timed preconstruction nesting surveys and implementing protection measures as described in Section 6.

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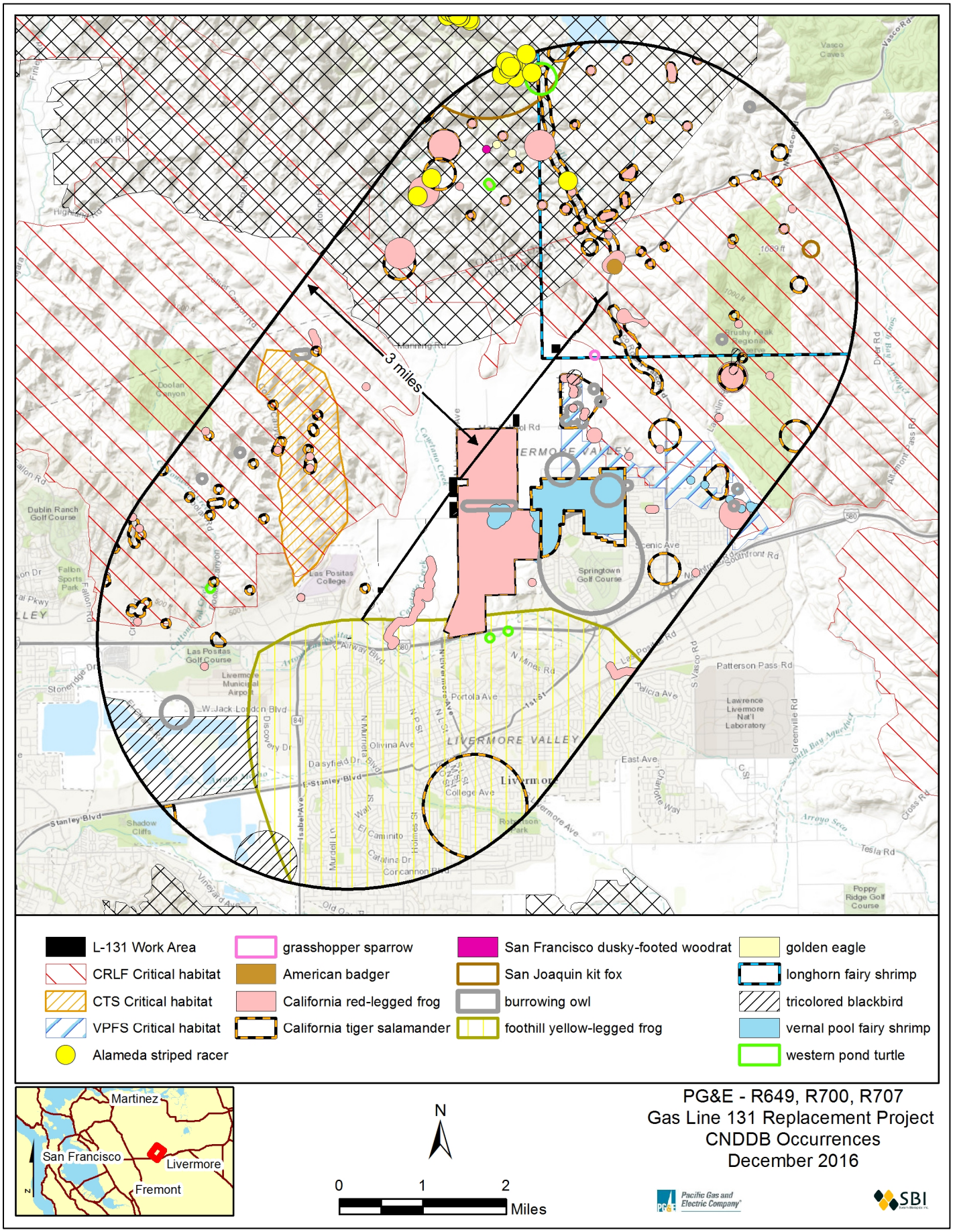
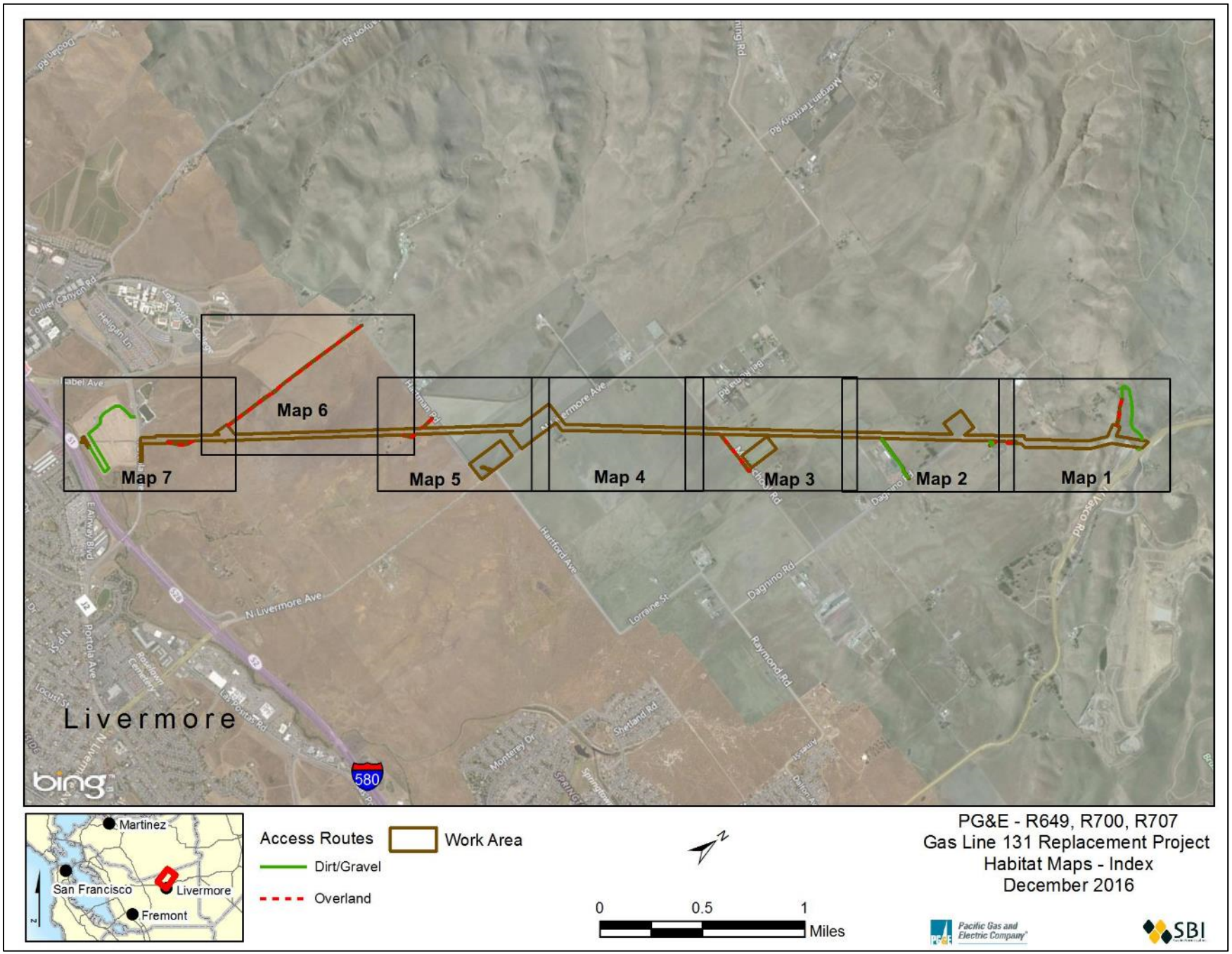
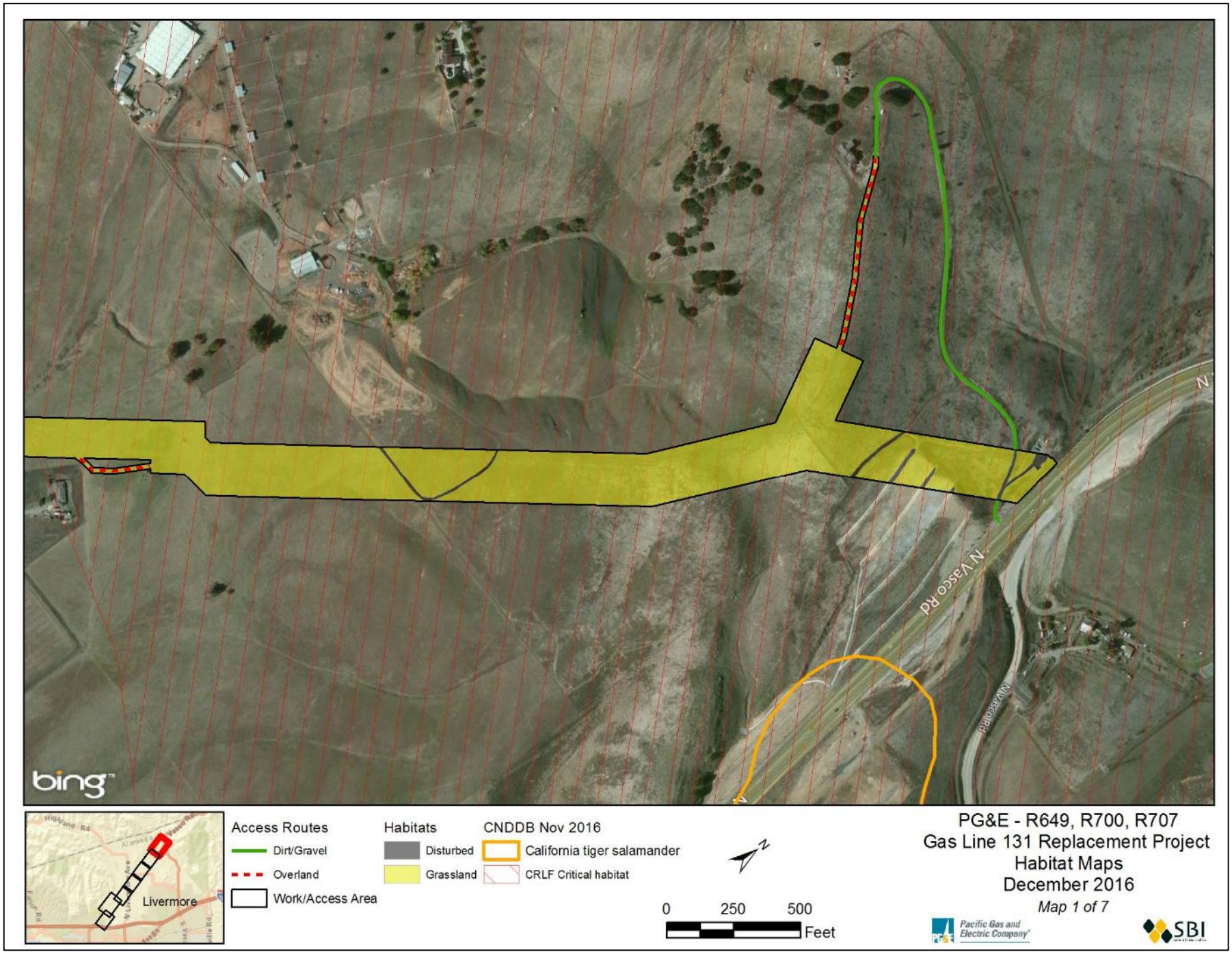
Figure 1. CNDDB Records in the Project Vicinity.



Figures 2-9. Maps of the assessment area.

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Gas Line 131 Replacement Project
Habitat Maps
December 2016
Map 1 of 7
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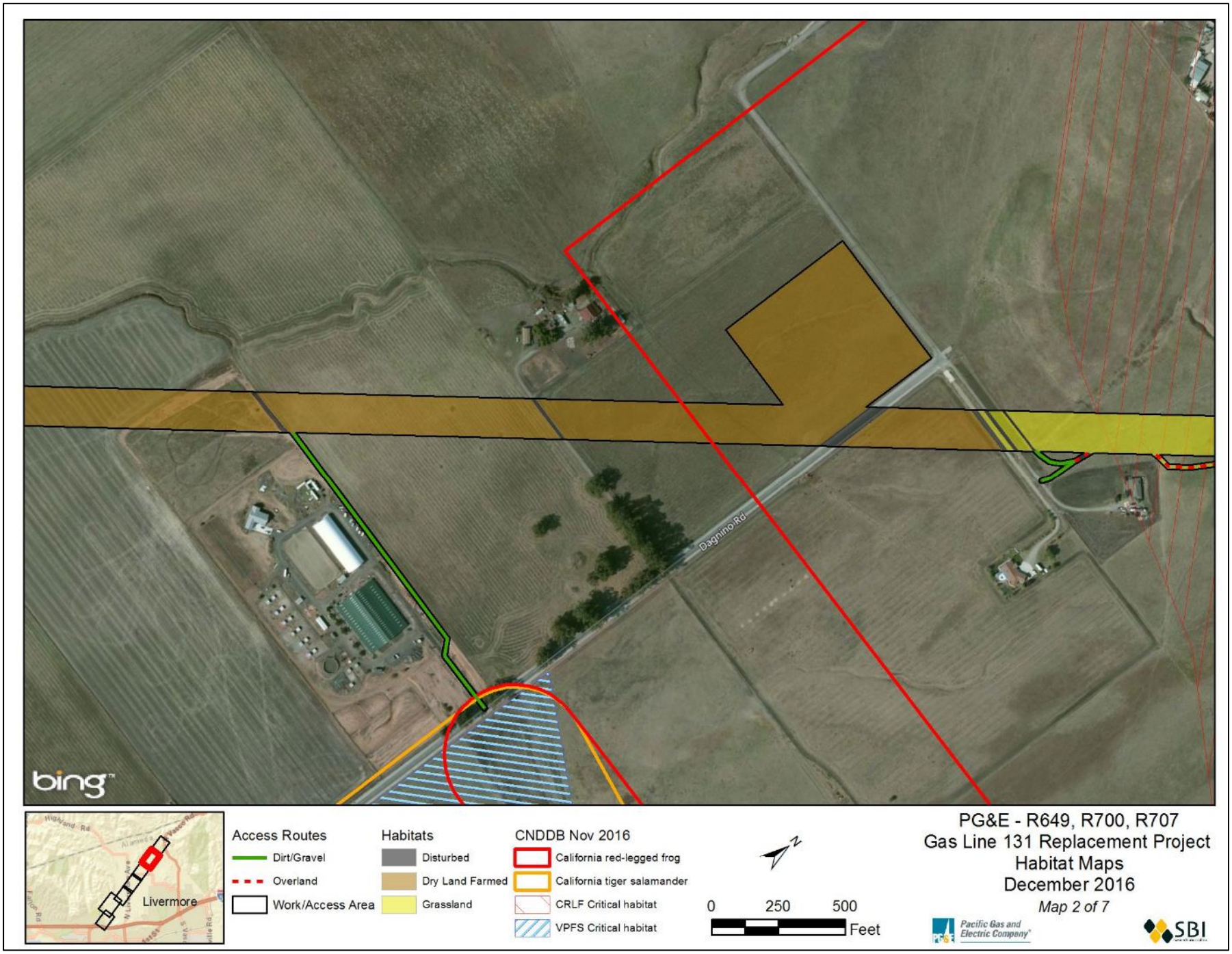
SBI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Habitat Maps
December 2016
Map 2 of 7
Pacific Gas and Electric Company
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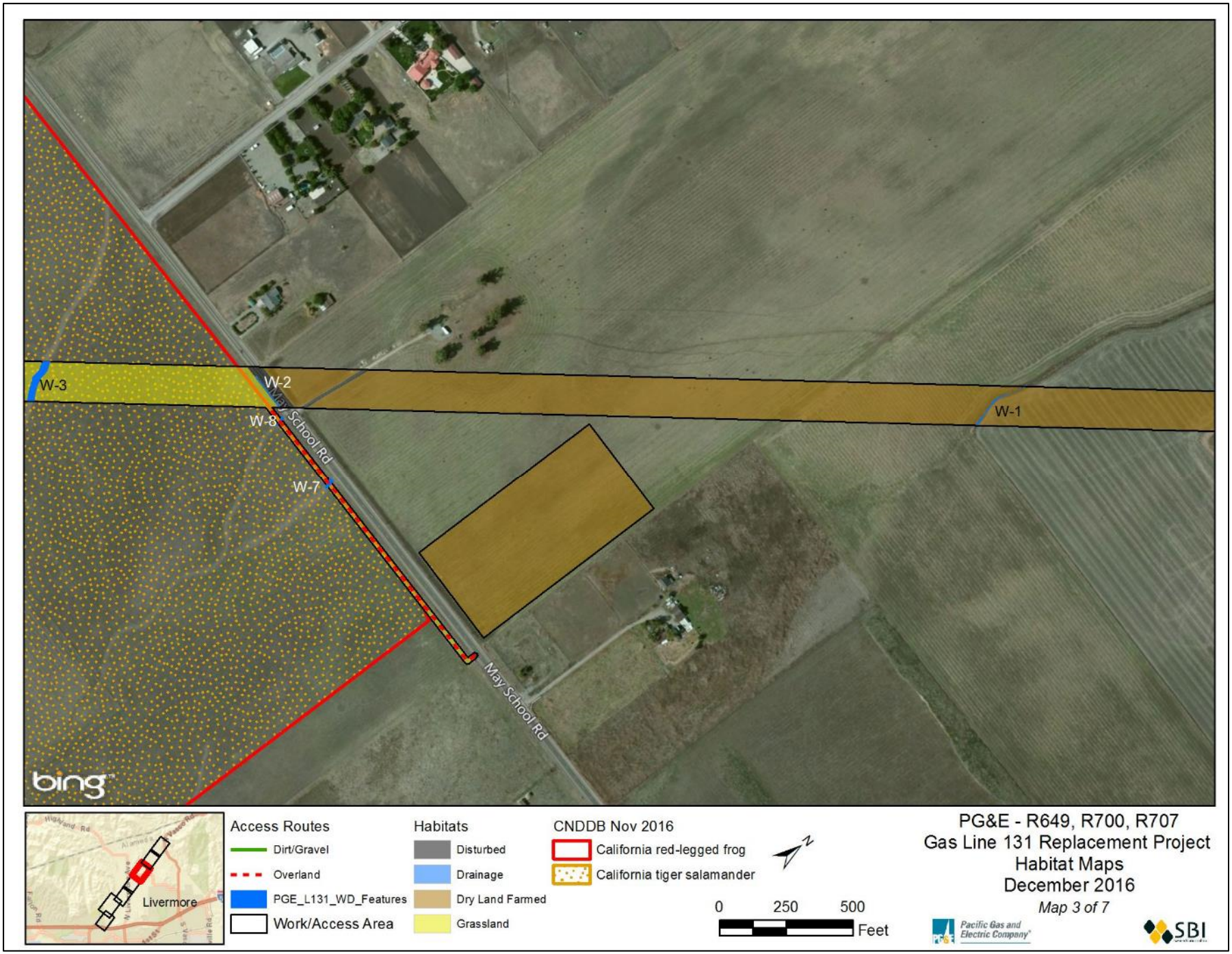
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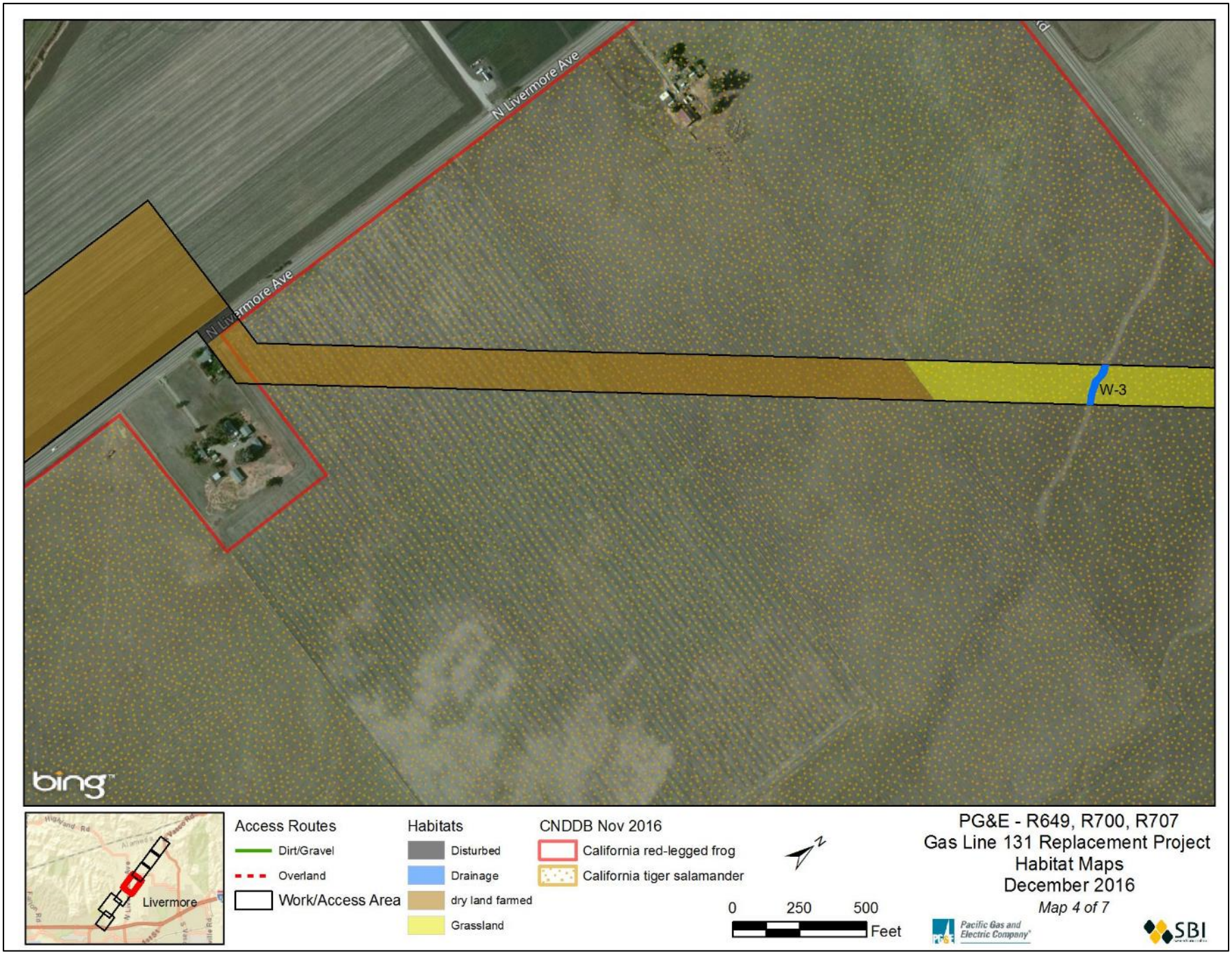
Gas Line 131 Replacement Project
Habitat Maps
December 2016
Map 3 of 7
Pacific Gas and Electric Company
SBI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Gas Line 131 Replacement Project
Habitat Maps
December 2016
Map 4 of 7
Pacific Gas and Electric Company
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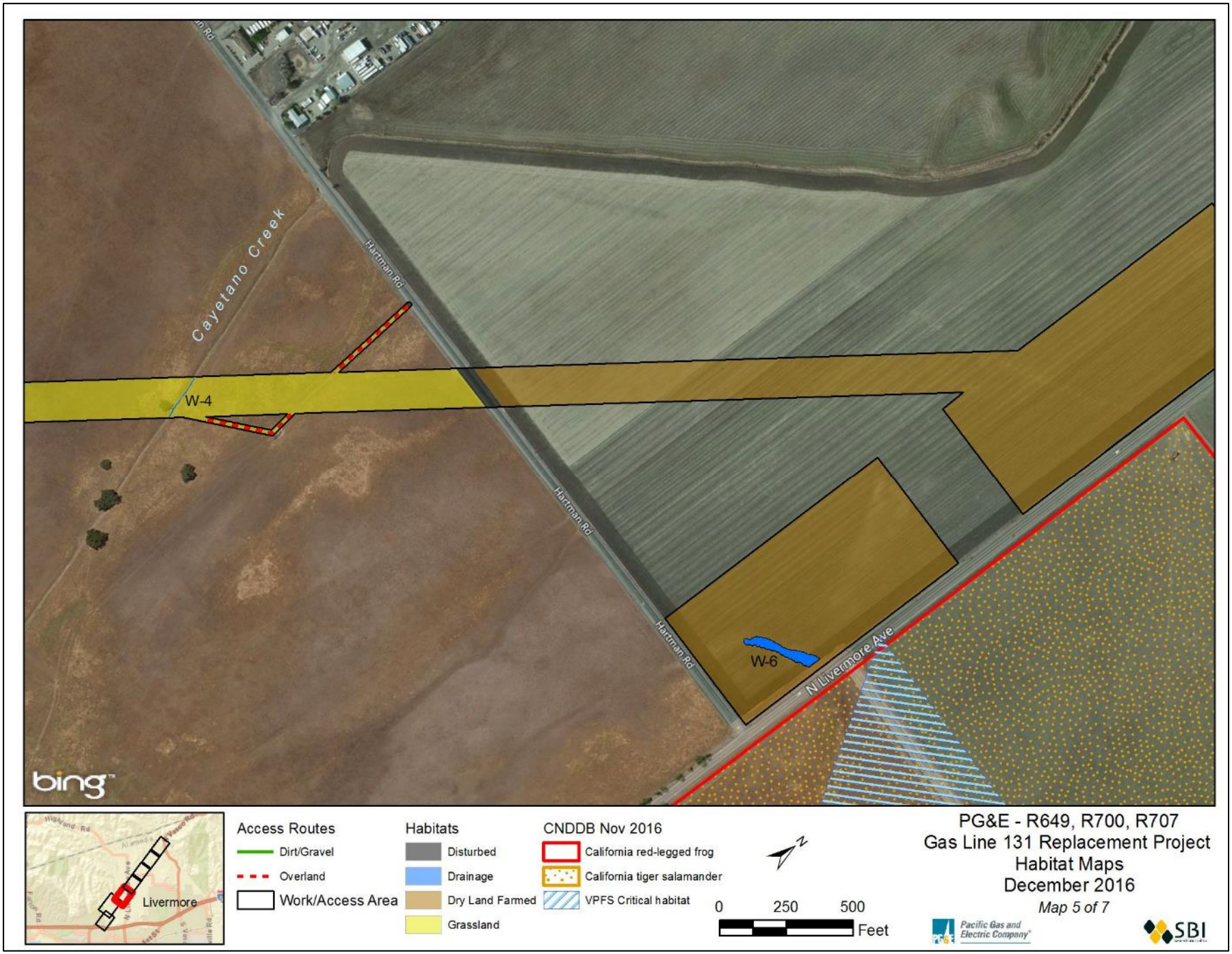
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Gas Line 131 Replacement Project
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December 2016
Map 5 of 7
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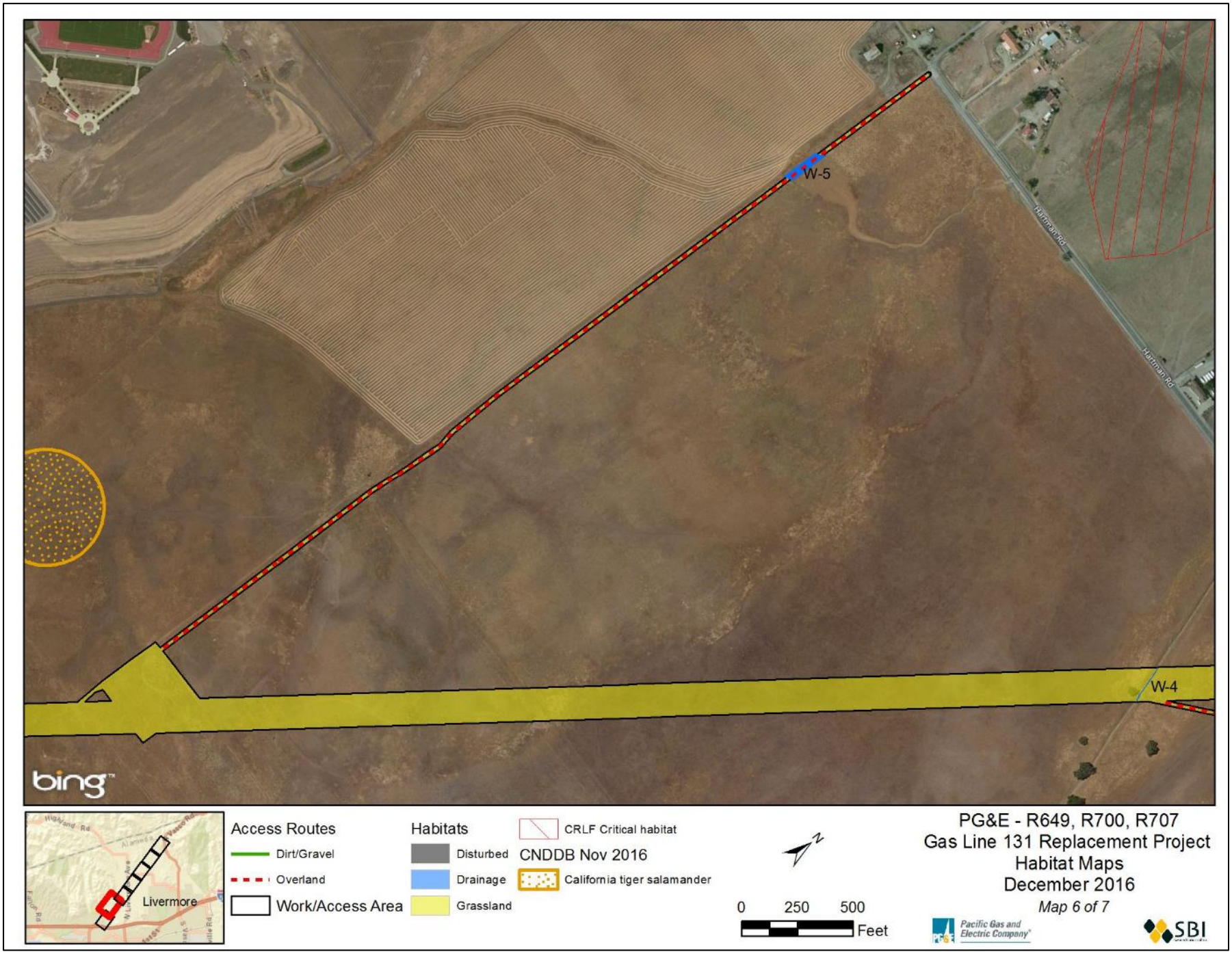
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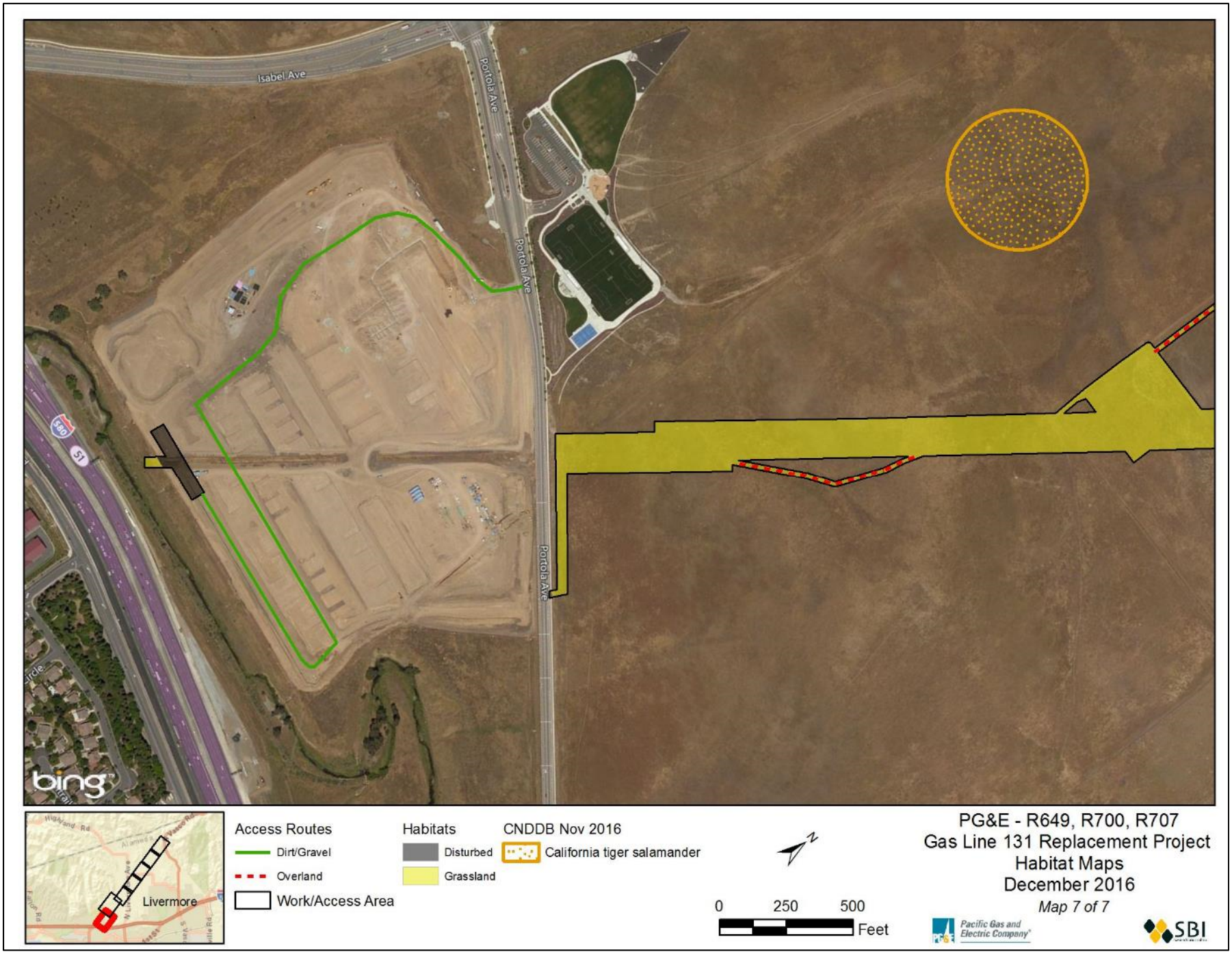
Gas Line 131 Replacement Project
Habitat Maps
December 2016
Map 6 of 7
Pacific Gas and Electric Company
SBI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Gas Line 131 Replacement Project
Habitat Maps
December 2016
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Pacific Gas and Electric Company
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Table 3. List of Species Considered for Analysis

Scientific Name	Common Name	Status			Habitat	Potential to Occur
		Federal	State	CDFW		
Invertebrates						
Callophrys mossii bayensis	San Bruno elfin butterfly	E	-	-	Occurs in coastal grassy mountainous areas near San Francisco Bay. Located on steep north facing slopes above 500' elevation that contain populations of host plant; *Sedum spathulifolium*. Uses a variety of nectar.	**Not Expected.** No suitable habitat is present in the project area.
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	T	-	-	Elderberry shrubs over 1" diameter in riparian and upland habitats in the Central Valley up to 3,000' elevation	**Not Expected.** No suitable habitat is present in the project area.
Crustaceans						
Brachinecta conservatio	Conservancy fairy shrimp	E	-	-	Vernal pools and swales in valley grassland.	**Not Expected.** No suitable habitat is present in the project area.
Brachinecta longiantenna	Longhorn fairy shrimp	E	-	-	Vernal pools and swales in valley grassland.	**Not Expected.** No suitable habitat is present in the project area.
Brachinecta lynchi	Vernal pool fairy shrimp	T	-	-	Vernal pools and swales in the central valley	**Not Expected.** No suitable habitat is present in the project area, however, critical habitat is present less than 100 feet from one of the project staging areas on the opposite side of North Livermore Ave.
Lepidurus packardi	Vernal pool tadpole shrimp	E	-	-	Vernal pools and swales in valley grassland.	**Not Expected.** No suitable habitat is present in the project area.
Fishes						
Hypomesus transpacificus	Delta Smelt	T	E	-	Endemic to California; occurs only in the brackish and freshwaters of the Sacramento-San Joaquin River Delta. Exhibits seasonal migration within the estuary, moving upstream before spawning.	**Not Expected.** No habitat suitable to support this species is present.
Oncorhynchus mykiss irideus	steelhead - Central California Coast DPS	T	-	-	Anadromous. Adults require access to natal streams to spawn; eggs and fry need cool water with adequate dissolved oxygen; clean gravel; juveniles migrate out to the ocean.	**Not Expected.** No habitat suitable to support this species is present.
Oncorhynchus mykiss irideus	steelhead - Central Valley DPS	T	-	-	Anadromous. Sacramento and San Joaquin Rivers and their tributaries; does not include steelhead from San Francisco Bay drainages; but it migrates through the San Francisco Bay and Sacramento	**Not Expected.** No habitat suitable to support this species is present.

Scientific Name	Common Name	Status			Habitat	Potential to Occur
		Federal	State	CDFW		
					San Joaquin Delta. Adults need access to natal streams; eggs and fry need cool water with adequate dissolved oxygen; clean gravel; juveniles migrate out to the ocean.	
Spirinchus thaleichthys	Longfin Smelt	C	T	SSC	Bay, estuary, and nearshore coastal aquatic environments.	**Not Expected.** No habitat suitable to support this species is present.
Thaleichthys pacificus	Eulachon	T	-	-	Nearshore ocean waters and to 1,000 feet in depth, except for the brief spawning runs into their natal streams. Spawning grounds are typically in the lower reaches of larger snowmelt-fed rivers. Spawning occurs over sand or coarse gravel substrates.	**Not Expected.** No habitat suitable to support this species is present.
Amphibians						
Ambystoma californiense	California tiger salamander	T	T	-	Ponds and vernal pools in grassland; and oak woodland.	**High.** Suitable habitat is present in the project area and there are numerous CNDDB occurrences within 5 miles.
Rana boylii	Foothill yellow-legged frog	-	-	SSC	Rocky streams and rivers with rocky substrate and open; sunny banks; in forests; chaparral; and woodlands.	**Not Expected.** No habitat suitable to support this species is present.
Rana draytonii	California red-legged frog	T	-	SSC	Lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development.	**High during wet weather, otherwise Moderate.** There is suitable dispersal habitat within the project area and there are numerous CNDDB occurrences within 5 miles.
Spea hammondii	Western spadefoot	-	-	SSC	Occurs primarily in grasslands; but occasional populations also occur in valley foothill hardwood woodlands.	**Low.** Marginally suitable habitat is present within the project area, however there are no known occurrences within 5 miles.
Reptiles						
Aniella pulchra pulchra	Silvery legless lizard	-	-	SSC	Sandy or loose loamy soils. Habitats include stabilized dunes; beaches; chaparral; and pineoak woodland. Also occurs near sycamores; cottonwoods; or oaks that grow on stream terraces. Often found in soil or leaf litter under vegetation.	**Not expected.** No habitat suitable to support this species is present.
Emys marmorata	Western pond turtle	-	-	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches, usually with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5km from water for egg laying.	**Low.** There are CNDDB occurrences within 5 miles, however there is no suitable habitat for this species within the project area.

Scientific Name	Common Name	Status			Habitat	Potential to Occur
		Federal	State	CDFW		
Coluber flagellum ruddocki	San Joaquin coachwhip	-	-	SSC	Open dry environments with little or no tree cover. Found in valley grassland and saltbrush scrub in the San Joaquin Valley. Mammal burrows are used for refuge and oviposition sites.	**Not Expected.** Suitable habitat is present within the project area, however there are no CNDDB occurrences within 10 miles and the project area is outside of the known range of this species.
Coluber lateralis euryxanthus	Alameda striped racer	T	T	-	Chaparral; northern coastal sage scrub; coastal sage; and grassland communities.	**Low.** Suitable habitat is present north of the project area and there is a very low potential for an individual to move outside of its normal habitat and into the project area.
Phrynosoma blainvillii	Coast horned lizard	-	-	SSC	Open areas of sandy soil and low vegetation in valleys; foothills and semiarid mountains; grasslands; coniferous forests; woodlands; and chaparral with open areas and patches of loose soil.	**Not Expected.** No habitat suitable to support this species is present.
Thamnophis gigas	Giant garter snake	T	T	-	Associated with aquatic habitats. Often occurs in or near agricultural wetlands and other waterways such as irrigation and drainage canals; sloughs; ponds; small lakes; low gradient streams; rice fields; freshwater marshes; and adjacent uplands in the Central Valley.	**Not Expected.** No habitat suitable to support this species is present.
Birds						
Agelaius tricolor	Tricolored blackbird	-	-	SSC	Emergent wetlands; grasslands; and agricultural fields. Breeds near fresh water; preferably in emergent wetlands in cattails or tules; but also in thickets of willow; wild rose; blackberry; or tall herbaceous species.	**Not expected (nesting).** Suitable foraging habitat is present within the project area and there are CNDDB occurrences within 5 miles; however suitable nesting habitat is absent.
Athene cunicularia	Western burrowing owl	-	-	SSC	Open, dry annual or perennial grasslands with low-growing vegetation and on the margins of disturbed/developed habitats. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	**High.** Suitable habitat is present within the project area and there are multiple CNDDB occurrences within 5 miles.
Aquila chrysaetos	Golden Eagle	-	-	FP	Open country; in prairies; tundra; open coniferous forest and barren areas; especially in hilly or mountainous regions. Typically nest on cliff ledges and in trees around large bodies of water.	**Low (nesting and wintering).** Suitable foraging habitat is present within the assessment but nesting habitat is marginal.

Scientific Name	Common Name	Status			Habitat	Potential to Occur
		Federal	State	CDFW		
Asio flammeus	Short-eared owl	-	-	SSC	Occupies a variety of open habitats. Nest on dry ground in open areas with dense herbaceous cover.	**Low (nesting).** Suitable habitat is present, however there are no occurrences within 10 miles of the assessment area.
Buteo swainsoni	Swainson's hawk	-	T	-	Nests in scattered trees or along riparian systems adjacent to agricultural fields or pastures; which are their primary foraging areas. Preferred nest trees are valley oak; cottonwood; willow; sycamore; and walnut.	**Not expected.** The assessment area is outside of the known distribution of this species. The nearest known records are greater than eight miles to the east.
Circus cyaneus	Northern Harrier	-	-	SSC	Sloughs; wet meadows; marshlands; swamps; prairies; plains; grasslands; and shrublands; large forest openings; open; low woody or herbaceous vegetation for nesting and hunting; nest on ground.	**Low (nesting).** Suitable foraging habitat is present within the project area. Potential nesting habitat is very limited within the assessment area.
Elanus leucurus	White-tailed kite	-	-	FP	Open grasslands; meadows; or marshes for foraging close to isolated; dense topped trees for nesting and perching.	**Moderate (nesting).** Suitable foraging habitat is present in the project area.
Haliaeetus leucocephalus	Bald eagle	D	E	FP	Requires relatively large bodies of water with populations of suitable-sized fish; Nests are typically located within 1 mile of foraging areas in large conifers	**Not expected (nesting). N**esting habitat is absent from the assessment area. Nearest CNDDB occurrence is nine miles away near Del Valle Reservoir.
Lanius ludovicianus	Loggerhead shrike	-	-	SSC	Open country with short vegetation: pastures with fence rows; old orchards; mowed roadsides; cemeteries; golf courses; agricultural fields; riparian areas; and open woodlands.	**Moderate.** Suitable habitat is present in the project area and there are CNDDB occurrences within 5 miles
Laterallus jamaicensis coturniculus	California black rail	-	T	FP	Tidal salt marshes of the San Francisco Bay; primarily in San Pablo and Suisun Bays. Prefers marshes close to the water (bay or river); large; away from urban areas; and saline to brackish with a high proportion of pickleweed, rushes and cattails.	**Not expected.** No habitat suitable to support this species is present.
Melospiza melodia mailliardi	Song sparrow ("Modesto" population)	-	-	SSC	Emergent freshwater marshes dominated by tules and cattails as well as riparian willow thickets. They also nest in riparian forests of valley oak with a sufficient understory of blackberry, along vegetated irrigation canals and levees, and in recently planted valley oak restoration sites.	**Not expected.** The assessment area is outside of the known distribution of this species. The nearest known records are greater than ten miles to the east.

Scientific Name	Common Name	Status			Habitat	Potential to Occur
		Federal	State	CDFW		
Ammodramus savannarum	Grasshopper sparrow	-	-	SSC	Short to medium height, moderately open grasslands with scattered shrubs.	**High.** Suitable habitat is present within the project area and there are CNDDB occurrences within one mile.
Sterna antillarum browni	California Least Tern	E	E	FP	Abandoned salt ponds and along estuarine shores in San Francisco Bay. Feeds primarily in shallow estuaries or lagoons where small fish are abundant. Nests on barren to sparsely vegetated site near water; usually on sandy or gravelly substrate.	**Not Expected.** No habitat suitable to support this species is present.
Mammals						
Antrozous pallidus	Pallid Bat	-	-	SSC	Frequently associated with desert areas but also occur in coniferous forests, non-coniferous woodlands, brushy terrain, rocky canyons, open farm land, and coast redwoods. Common roost sites are rock crevices, old buildings, bridges, caves, mines, hollow trees, and bridges.	**Low.** No records are known from the project vicinity. Potential roosting habitat located in an abandoned home near an access route to the northernmost portion of the assessment area.
Corynorhinus townsendii	Townsend's big-eared bat	-	CT	SSC	Throughout California in a wide variety of habitats. Found regularly in forested regions and buildings, and in areas with a mosaic of woodland, grassland, and/or shrubland. Night roosts include caves, buildings, and tree cavities. Hibernates in buildings (in California). Does not use crevices or cracks, instead hanging from the ceiling, generally near the zone of total darkness. Extremely sensitive to human disturbance. Hunts around the perimeter of trees and woodlands, primarily along the edges of riparian vegetation.	**Low.** No records are known from the project vicinity. Potential roosting habitat located in an abandoned home near an access route to the northernmost portion of the assessment area.
Lasiurus blossevillii	Western red bat	-	-	SSC	Roost in dense tree foliage & orchards; feed along forest edges; in small clearings; or around street lights. Closely associated with cottonwoods in riparian areas at elevations below 6,500 feet.	**Not Expected.** No habitat suitable to support this species is present.
Neotoma fuscipes annectens	San Francisco Dusky-footed woodrat	-	-	SSC	Oak and conifer woodlands; scrub communities; riparian habitats.	**Not Expected.** No habitat suitable to support this species is present.

Scientific Name	Common Name	Status			Habitat	Potential to Occur
		Federal	State	CDFW		
Taxidea taxus	American badger	-	-	SSC	Open areas; plains and prairies; farmland and woodland edges. Constructs deep burrows for the pursuit of prey and for sleeping.	**Moderate.** Suitable habitat is present within the project area and there are CNDDB occurrences within five miles. However, this species is rarely encountered.
Vulpes macrotis mutica	San Joaquin kit fox	E	T	-	Grasslands and scrublands and agricultural mosaics of row crops; irrigated pastures; orchards; vineyards; and grazed annual grasslands.	**Low.** Suitable habitat is present within the project area and there are CNDDB records within 5 miles. However, sightings in the area are rare and the project area lies along the limits of this species' range.

Appendix C. Representative Photographs of the L131 R707, R700, and R649 Pipeline Replacement Project Assessment Area taken on February 19, 2016 and October 19, 2016.

R707

Photo 1. Northern end of segment R707. The area is just west of Vasco Road and consists of grazed grassland. Taken facing NE. (10/19/16)

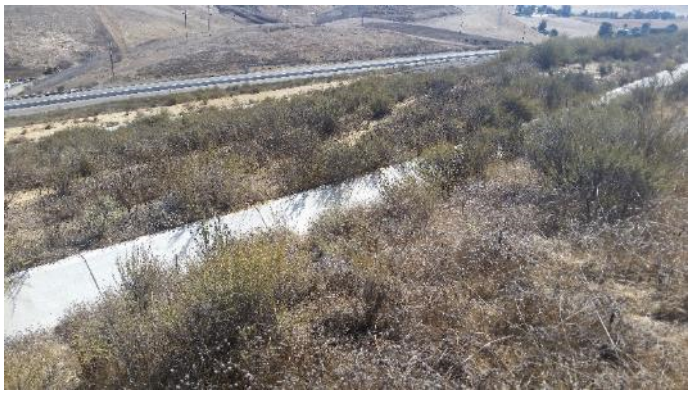


Photo 2. Concrete drainage feature at the northern end of the assessment area. (10/19/16)

Photo 3. Northeast facing slope at the northern end of segment R707. This area was not heavily grazed but several burrows were still detected. Taken facing SW. (10/19/16)

Photo 4. Access road to laydown and staging area for segment R707. Taken facing N. (10/19/16)

Photo 5. South facing slope along R707 segment. The meeting point between segments R707 and R700 is located near the first ranch house in the background. Taken facing SW. (10/19/16)

Photo 6. Access road to lower section of R707. Multiple ground squirrel burrow complexes are located in this area. Taken facing S. (10/19/16)

R700

Photo 7. Northern end of segment R700. This area is north of the terminus of Dagnino Road and consists of a grazed cattle pasture. Taken facing S. (2/19/16)

Photo 8. Drainage swale north of Dagnino Road. This drainage feature contains burrows constructed by ground squirrels that provide suitable upland habitat for CTS. Taken facing N. (2/19/16)

Photo 9. Fences along cattle pastures north and east of Dagnino Road within segment R700. The drainage swale passes underneath a gravel driveway leading to a private resident visible on the right side of the photo. Taken facing E. (2/19/16)

Photo 10. Active ground squirrel burrows that provide suitable uplands for CTS are present along the fences in this part of the assessment area. Taken facing E. (2/19/16)

Photo 11. Annual grassland on the east and west sides of Dagnino Road. These areas show evidence of use by cattle and past tillage for hay production. These fields contained relatively few rodent burrows compared with the cattle pasture north of Dagnino Road. (2/19/16)

Photo 12. Rows of mature trees at the eastern edge of the field west of Dagnino Road. The project alignment is located to the right of the trees. (2/19/16)

Photo 13. Same field as shown in Photo 12 after it has been fully grazed. This field will be used as a laydown and staging area. Taken facing S. (10/19/16)

Photo 14. Slight drainage swale present along the western edge of the Dagnino staging area. This feature contained several ground squirrel burrow complexes. Taken facing S. (10/19/16)

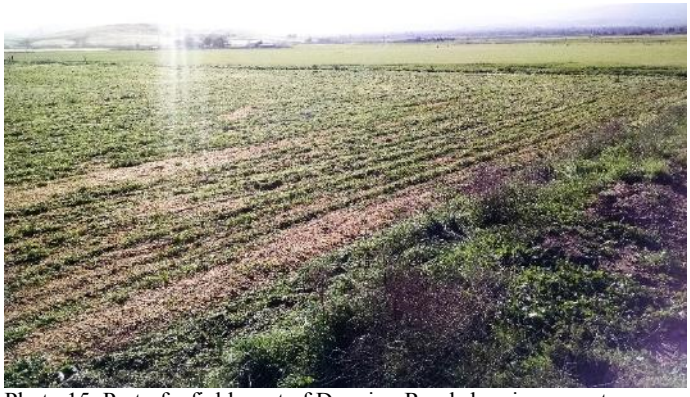


Photo 15. Part of a field west of Dagnino Road showing recent evidence of tilling and fertilizing. Taken facing S. (2/19/16)

Photo 16. Raised area within a field west of Dagnino Road apparently used to deposit fill material. This area contained numerous burrows made by ground squirrels and other burrowing mammals. Taken facing W. (2/19/16)

Photo 17. Cattle pasture south of May School Road. Shallow, ephemeral drainage swales convey water south toward a vernal pool complex adjacent to Arroyo Las Positas that is outside of the assessment area. These swales do not provide suitable habitat for vernal pool fairy shrimp or other special status branchiopods. Taken facing S. (2/19/16)

Photo 18. Portion of the assessment area immediately east of North Livermore Avenue. In this area the alignment passes near two residences and crosses a residential driveway with ornamental trees and mowed fields. Taken facing W. (2/19/16)

Photo 19. Laydown and staging area along north side of May School Road. This area had extremely low burrow density. Taken facing NW. (10/19/16)

Photo 20. Laydown and staging area at the corner of Hartman Road and North Livermore Avenue. This area shows evidence of tilling, most likely for hay production. Taken facing SE. (10/19/16)

Photo 21. Field show in Photo 18 during the growing season. This area was mostly devoid of burrows, however cracks in soil could provide refuge for CTS. Taken facing N. (2/19/16)

Photo 22. Field on the north side of Hartman Road. Cayetano Creek (not visible here) flows approximately parallel to the project alignment in this field about 1,000 feet to the west. Taken facing S. (2/19/16)

Photo 23. Metal fencing and gates staged along a fence within the assessment area south of Hartman Road. The surrounding area contained a large number of active ground squirrel burrows. Taken facing SW. (2/19/16)

Photo 24. Pipeline span across the channelized portion of Cayetano Creek within the action area. Taken facing N. (2/19/16)

Photo 25. High density of ground squirrel burrows along the west bank of Cayetano Creek. Taken facing W. (2/19/16)

Photo 26. A mature blue oak within the assessment area containing a historic (currently inactive) raptor nest, visible in this photo as a black spot near the top of the tree. Taken facing E. (2/19/16)

Photo 27. Field south of Hartman Road and west of Cayetano creek. This area is characterized by relatively flat topography and dense, poorly-drained clay soils that support very few rodent burrows. Taken facing N. (2/19/16)

Photo 28. Topography within the assessment area is hillier and animal burrows are more common as soils transition to more friable clay-loam about midway between Cayetano Creek and Portola Drive. (2/19/16)

Photo 29. Pipeline marker showing location of Gas Line 131 in an area south of Hartman Road. The field on the left is currently used for cattle pasture and the area on the left has been recently tilled. Taken facing S. (2/19/16)

Photo 30. A portion of the project area south of Hartman Road. The pipeline alignment in this area has not been tilled and still contains numerous ground squirrel burrows. This area was classified as annual grassland. (2/19/16)

Photo 31. Large (>10") burrow within the assessment area south of Hartman Road suitable for use by a canine, such as a coyote or San Joaquin kit fox. (2/19/16)

Photo 32. Wooden post and barbed wire fence separating the recently tilled area from an adjacent pasture south of Hartman Road. Taken facing S. (2/19/16)

Photo 33. Pasture near the southern terminus of the R700 segment. Taken facing E. (2/19/16)

Photo 34. Southern terminus of the R700 segment. Portola Avenue is visible in the center of the photo. Taken facing S. (2/19/16)

R649

Photo 35. Proposed access to the northern portion of the R649 segment from Portola Avenue. Ground squirrel burrows were present along the slope. Taken facing E. (10/19/16)

Photo 36. Proposed access to southern portion of the R649 segment through an active housing construction area just south of Portola Avenue. Taken facing E. (10/19/16)

Photo 37. Pipeline alignment heads south from the housing development down a steep bank and toward Arroyo Las Positas. Small mammal burrows are located within the bank. Taken facing S. (10/19/16)

Photo 38. Arroyo Las Positas is adjacent to the southern terminus of the R649 segement. No amphibians were observed in the creek; however, it did contain non-native mosquitofish and crayfish. Taken facing W. (10/19/16)

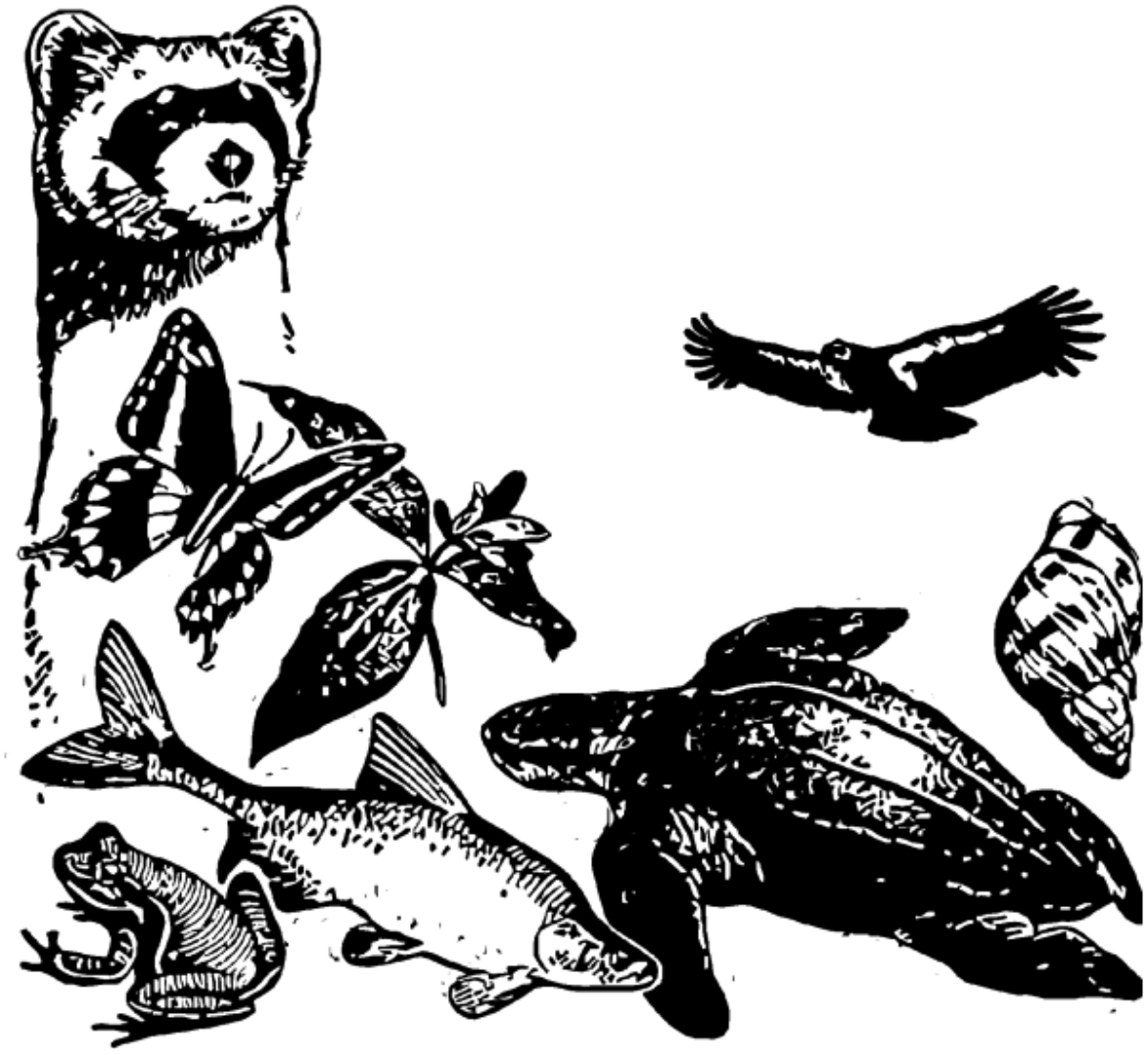
U.S. Fish & Wildlife Service

L131 Replacement Project

IPaC Trust Resources Report

Generated November 11, 2016 01:30 PM MST, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

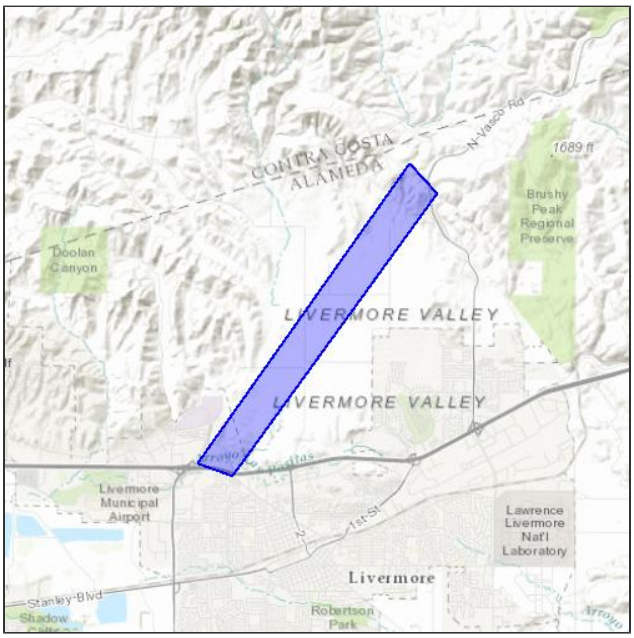
L131 Replacement Project

LOCATION

Alameda County, California

IPAC LINK

https://ecos.fws.gov/ipac/project/DAV54-QONZV-DBDIM-QHI2G-DZP3SA



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Amphibians

California Red-legged Frog Rana draytonii — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=D02D

California Tiger Salamander Ambystoma californiense — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=D01T

Birds

California Least Tern Sterna antillarum browni — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B03X

Crustaceans

Conservancy Fairy Shrimp Branchinecta conservatio — Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=K03D

Vernal Pool Fairy Shrimp Branchinecta lynchi — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=K03G

Vernal Pool Tadpole Shrimp Lepidurus packardi — Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=K048

Fishes

Delta Smelt Hypomesus transpacificus — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E070

Steelhead Oncorhynchus (=Salmo) mykiss — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E08D

Flowering Plants

Contra Costa Goldfields Lasthenia conjugens — Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q122

Large-flowered Fiddleneck Amsinckia grandiflora — Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q1SU

Palmate-bracted Bird's Beak Cordylanthus palmatus — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q1UT

Insects

San Bruno Elfin Butterfly Callophrys mossii bayensis — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=I00Q

Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=I01L

Mammals

San Joaquin Kit Fox Vulpes macrotis mutica — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A006

Reptiles

Alameda Whipsnake (=striped Racer) Masticophis lateralis euryxanthus — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C04A

Giant Garter Snake Thamnophis gigas — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C057

Critical Habitats

This location overlaps all or part of the critical habitat for the following species:

California Red-legged Frog Rana draytonii

Final designated critical habitat

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=D02D#crithab

Vernal Pool Fairy Shrimp Branchinecta lynchi

Final designated critical habitat

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=K03G#crithab

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

Allen's Hummingbird Selasphorus sasin — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0LI

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Bell's Sparrow Amphispiza belli — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HE

Black Oystercatcher Haematopus bachmani — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0KJ

Black Rail Laterallus jamaicensis — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09A

Burrowing Owl Athene cunicularia — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Costa's Hummingbird Calypte costae — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JE

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Lawrence's Goldfinch Carduelis lawrencei — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J8

Least Bittern Ixobrychus exilis
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B092

Lesser Yellowlegs Tringa flavipes — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MD

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Marbled Godwit Limosa fedoa — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JL

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Nuttall's Woodpecker Picoides nuttallii — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HT

Oak Titmouse Baeolophus inornatus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MJ

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Rufous-crowned Sparrow Aimophila ruficeps — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MX

Short-billed Dowitcher Limnodromus griseus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JK

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Swainson's Hawk Buteo swainsoni — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Tricolored Blackbird Agelaius tricolor — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06P

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Yellow-billed Magpie Pica nuttalli — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0N8

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

PEMC
PEMCh

Freshwater Pond

PUBFx
PUBHh

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects)
 AND Quad IS (Altamont (3712166) OR Antioch South (3712187) OR Brentwood (3712186) OR Byron Hot Springs (3712176) OR Cedar Mtn. (3712155) OR Clayton (3712188) OR Clifton Court Forebay (3712175) OR Diablo (3712178) OR Dublin (3712168) OR La Costa Valley (3712157) OR Livermore (3712167) OR Mendenhall Springs (3712156) OR Midway (3712165) OR Niles (3712158) OR Tassajara (3712177) OR Woodward Island (3712185))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Alameda song sparrow *Melospiza melodia pusillula*	ABPBXA301S	None	None	G5T2?	S2S3	SSC
Alameda whipsnake *Masticophis lateralis euryxanthus*	ARADB21031	Threatened	Threatened	G4T2	S2	
American badger *Taxidea taxus*	AMAJF04010	None	None	G5	S3	SSC
American peregrine falcon *Falco peregrinus anatum*	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Antioch andrenid bee *Perdita scitula antiochensis*	IIHYM01031	None	None	G1T1	S1	
Antioch efferian robberfly *Efferia antiochi*	IIDIP07010	None	None	G1G2	S1S2	
bald eagle *Haliaeetus leucocephalus*	ABNKC10010	Delisted	Endangered	G5	S3	FP
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	AMAFD03061	None	None	G3G4T1	S1	
Blennosperma vernal pool andrenid bee *Andrena blennospermatis*	IIHYM35030	None	None	G2	S2	
Bridges' coast range shoulderband *Helminthoglypta nickliniana bridgesi*	IMGASC2362	None	None	G3T1	S1S2	
burrowing owl *Athene cunicularia*	ABNSB10010	None	None	G4	S3	SSC
California black rail *Laterallus jamaicensis coturniculus*	ABNME03041	None	Threatened	G3G4T1	S1	FP
California horned lark *Eremophila alpestris actia*	ABPAT02011	None	None	G5T3Q	S3	WL
California linderiella *Linderiella occidentalis*	ICBRA06010	None	None	G2G3	S2S3	
California red-legged frog *Rana draytonii*	AAABH01022	Threatened	None	G2G3	S2S3	SSC
California tiger salamander *Ambystoma californiense*	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
coast horned lizard *Phrynosoma blainvillii*	ARACF12100	None	None	G3G4	S3S4	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Cooper's hawk *Accipiter cooperii*	ABNKC12040	None	None	G5	S4	WL
Crotch bumble bee *Bombus crotchii*	IIHYM24480	None	None	G3G4	S1S2	
curved-foot hygrotus diving beetle *Hygrotus curvipes*	IICOL38030	None	None	G1	S1	
Delta smelt *Hypomesus transpacificus*	AFCHB01040	Threatened	Endangered	G1	S1	
eulachon *Thaleichthys pacificus*	AFCHB04010	Threatened	None	G5	S3	
ferruginous hawk *Buteo regalis*	ABNKC19120	None	None	G4	S3S4	WL
foothill yellow-legged frog *Rana boylii*	AAABH01050	None	None	G3	S3	SSC
golden eagle *Aquila chrysaetos*	ABNKC22010	None	None	G5	S3	FP
grasshopper sparrow *Ammodramus savannarum*	ABPBXA0020	None	None	G5	S3	SSC
great blue heron *Ardea herodias*	ABNGA04010	None	None	G5	S4	
hoary bat *Lasiurus cinereus*	AMACC05030	None	None	G5	S4	
loggerhead shrike *Lanius ludovicianus*	ABPBR01030	None	None	G4	S4	SSC
longfin smelt *Spirinchus thaleichthys*	AFCHB03010	Candidate	Threatened	G5	S1	SSC
longhorn fairy shrimp *Branchinecta longiantenna*	ICBRA03020	Endangered	None	G1	S1S2	
midvalley fairy shrimp *Branchinecta mesovallensis*	ICBRA03150	None	None	G2	S2S3	
molestan blister beetle *Lytta molesta*	IICOL4C030	None	None	G2	S2	
northern harrier *Circus cyaneus*	ABNKC11010	None	None	G5	S3	SSC
obscure bumble bee *Bombus caliginosus*	IIHYM24380	None	None	G4?	S1S2	
pallid bat *Antrozous pallidus*	AMACC10010	None	None	G5	S3	SSC
prairie falcon *Falco mexicanus*	ABNKD06090	None	None	G5	S4	WL
San Bruno elfin butterfly *Callophrys mossii bayensis*	IILEPE2202	Endangered	None	G4T1	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	AMAFF08082	None	None	G5T2T3	S2S3	SSC
San Joaquin coachwhip *Masticophis flagellum ruddocki*	ARADB21021	None	None	G5T2T3	S2?	SSC
San Joaquin kit fox *Vulpes macrotis mutica*	AMAJA03041	Endangered	Threatened	G4T2	S2	
San Joaquin Pocket Mouse *Perognathus inornatus*	AMAFD01060	None	None	G2G3	S2S3	
sharp-shinned hawk *Accipiter striatus*	ABNKC12020	None	None	G5	S4	WL
short-eared owl *Asio flammeus*	ABNSB13040	None	None	G5	S3	SSC
silvery legless lizard *Anniella pulchra pulchra*	ARACC01012	None	None	G3G4T3T4Q	S3	SSC
song sparrow ("Modesto" population) *Melospiza melodia*	ABPBXA3010	None	None	G5	S3?	SSC
steelhead - central California coast DPS *Oncorhynchus mykiss irideus*	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
steelhead - Central Valley DPS *Oncorhynchus mykiss irideus*	AFCHA0209K	Threatened	None	G5T2Q	S2	
Swainson's hawk *Buteo swainsoni*	ABNKC19070	None	Threatened	G5	S3	
Townsend's big-eared bat *Corynorhinus townsendii*	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
tricolored blackbird *Agelaius tricolor*	ABPBXB0020	None	Candidate Threatened	G2G3	S1S2	SSC
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	IICOL48011	Threatened	None	G3T2	S2	
vernal pool fairy shrimp *Branchinecta lynchi*	ICBRA03030	Threatened	None	G3	S3	
vernal pool tadpole shrimp *Lepidurus packardi*	ICBRA10010	Endangered	None	G4	S3S4	
western bumble bee *Bombus occidentalis*	IIHYM24250	None	None	G2G3	S1	
western pond turtle *Emys marmorata*	ARAAD02030	None	None	G3G4	S3	SSC
western red bat *Lasiurus blossevillii*	AMACC05060	None	None	G5	S3	SSC
western spadefoot *Spea hammondii*	AAABF02020	None	None	G3	S3	SSC
white-tailed kite *Elanus leucurus*	ABNKC06010	None	None	G5	S3S4	FP

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Yuma myotis	AMACC01020	None	None	G5	S4	
Myotis yumanensis						

Record Count: 60